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HINDU LOGIC AS PRESERVED IN CHINA AND JAPAN

BY

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PREFACE.

It is scarcely necessary to say that, for the material contained in this monograph—material within the reach of those only who can make free use of the Chinese literature—Mr. Sugiura alone is responsible. The editor has freely modified the language used by the writer, whose acquaintance with English is not that of a native; and he has, for the sake of greater clearness, made some changes in arrangement. He has, too, added a few foot-notes. But he has not felt justified in suppressing any of the opinions expressed by the author, who has since returned to Japan, nor in taking greater liberties with the text than have been indicated above.

The monograph is a dissertation offered in partial fulfillment of the conditions for securing the degree of Doctor of Philosophy at the University of Pennsylvania. It has seemed of sufficient interest to students of Logic to warrant its admission into the series in which it is printed.

The thanks of the Editor and myself are due to our colleague, Professor Morton W. Easton, for his kindness in reading the proofs with a critical eye to the orthography of the Sanskrit names and terms scattered over them.

GEORGE STUART FULLERTON.

UNIVERSITY OF PENNSYLVANIA,
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CONTENTS.

INTRODUCTION.

§ 1. *Review of Hindu Philosophy.*—European scholars have usually recognized six great schools of Indian Philosophy: Sāṃkhya, Yoga, Mīmāṃsā, Vedānta, Vaiçeshika and Nyāya. These schools are not only orthodox, recognizing, that is, the Brahman class prerogatives and the infallibility of the sacred Vedas, but may be taken actually to have developed out of the Vedic system. The old hymns of the Rig-veda reveal a struggle after a unitary principle underlying the manifold of phenomena. As we go on toward the later period of Vedic poetry, problems resembling those of a monotheistic theology and others of a more or less philosophical character (such as the problem of the origin of the world) begin to appear. The implicit philosophy of the Vedas becomes explicit in the Upanishads, whose central problem is that of the Eternal One, the Atman.[1] And the problems of the schools are enough like these to warrant us in treating them as an historical outgrowth.

The chronological order of these schools is not beyond dispute. Professor Richard Garbe holds the Sāṃkhya to be the oldest school, this to have been followed by the Yoga, this in turn by the Mīmāṃsā and Vedānta, and last of all by the Vaiçeshika and Nyāya.[2] Dr. J. Murray Mitchell gives them in a little different order: Nyāya and Vaiçeshika, Sāṃkhya and Yoga, Mīmāṃsā and Vedānta.[3]

[1] For the Philosophy of the Vedas and of the Upanishads see Deussen's "System des Vedānta," and his "Allg. Gesch. d. Philos." Also Gough's "The Philosophy of the Upanishads."

[2] Die Sāṃkhya Philosophie, p. 109.

[3] In his "Hinduism, Past and Present."

Respecting these questions of classification and genesis, our Chinese and Japanese sources give us much less information than that which is already in the possession of the occidental scholars. Such suggestions of classification as are to be found show the widest divergence of opinion. We find references to "two systems," "three kinds," "four doctrines," "six masters," "ten teachers," "twenty," "ninety-six," or even "ninety-three thousand kinds." Of these the only one which suggests the occidental classification is that which refers to the "six masters," but the suggestion is little more than numerical. The six sects chosen differ considerably in the two cases; the only identical classes being the Sāṃkhya and the Vaiçeshika. The recognition of these two schools is, indeed, the one constant element in the various classifications that have been attempted. As to the chronological order of the various sects, scarcely any information is to be obtained from the sources in question.

The carelessness of classification and the lack of historical information in Chinese and Japanese sources is readily to be explained. All the books on Hindu philosophy in these languages are the work of Buddhist monks whose interest was primarily theological. The questions of development and of classification were therefore of little import to them, and received correspondingly little consideration at their hands. Being able, for these reasons, to add nothing from Chinese and Japanese sources to the discussion of classification and chronological order, I shall, in this introductory sketch, accept the arrangement of Garbe, and confine myself to outlining the information to be drawn from such sources concerning the teachings of the various schools that Garbe has designated.

I. The Sāṃkhya Philosophy of Kapila.

The main principles of the Sāṃkhya are contained in the work called "Kin Shichiju Ron" (The Golden Treatise of Seventy), which was translated into Chinese. The founder

of the system is called Kapila, "yellow-head," probably a reference to the color of his hair.[1] The work consists of seventy aphorisms; but it is said that originally there were sixty thousand, the number having been reduced to seventy by a later philosopher.[2] Kapila founded the doctrine of the "twenty-five principles." This he taught to Ashli,[3] who handed the doctrine down to Panshiha, from whom it passed on to Urukya, to Vabhari and finally to Koshi.[4] It is generally believed that the "Treatise of Seventy" represents the original oral teachings of Kapila, transmitted in the manner described to Koshi and written down by him. The date of the work is unknown; it must, however, have been prior to Seishi[5] who annotated it.[6]

The "twenty-five principles" propounded by the Sāṃkhya are the following:[7]

1. Nature (Matter or Substance).
2. Perception.
3. Ego.

4 to 8. The five elements.—Earth, Water, Fire, Wind and Space.

9 to 13. The five qualities.—Color, Sound, Smell, Taste and Touch.

14 to 18. The five senses.—Visual, Auditory, Olfactory, Gustatory and Tactile.

19 to 23. The five actions.—Of Tongue, of Hands, of Feet, of Sex, of General Bodily Activity.

24. Mind.

25. Soul.

[1] Ishiki-jutsuki, 1: 23.

[2] Kin Shichiju Ron Bikoh, 1: 6.

[3] These and the following names are given according to the Chinese transliteration of the Sanskrit.

[4] He is also called Jizai-Koku,—"free black."

[5] Vasubhandu. Vid. § 4.

[6] Ishiki-jutsuki, 1: 24.

[7] Kin Shichiju Ron So, 1: 6.

Of these, the first, Nature (Prakṛti), and the last, Soul (Purusha), are eternal: the rest are transitory. If it is asked how we come to know these twenty-five, the Golden Treatise answers, (1) by fact; (2) by comparison; (3) by holy sayings.[1] That is, (1) by the immediate perception of things; (2) by the comparison of one thing with another or with others, either (*a*) preceding, (*b*) following, or (*c*) co-existing with it; (3) the teachings of the sage, which transcend the observations and comparisons of ordinary men. Nature and Soul can be known by comparison of co-existences and by holy sayings; the other principles by fact and by the three types of comparison.[2] Such is the epistemology of the Sāṃkhya.

The most important element in the Sāṃkhya Philosophy is the doctrine of the relation of Nature to Soul. "Nature," says the Golden Treatise, "is the Supreme Cause, the Highest." It cannot be felt or perceived, but it is active, and when it acts the next twenty-three principles become manifest in their order. From Nature comes Perception; from Perception, Ego; from Ego, Qualities, Senses, Actions, Mind, and from Qualities come the Elements. Nature has three attributes, Courage (Sattva), Passion (Rajas), and Darkness (Tamas). The product of Nature's activity is influenced by the ratios in which these three virtues are exercised. One may predominate over the others, the three may act in perfect harmony, some of them may be transformed into another, two of them may operate without the third, and they may in one case produce a thing quite different from that which they produce in another.[3] Both Nature and Soul are eternal, but Nature alone possesses these virtues, and by them or through them is productive. The Soul lacks such virtues, and can produce nothing.

[1] Kin Shichiju Ron, 1:4; Kin Shichiju Ron Bikoh, 1:17.
[2] Cf. the three bases of reasoning in the Nyāya Logic, §§ 3, 4, 5, 23 and 24.
[3] Kin Shichiju Ron, 1:11.

It is rather hard to tell what the Sāṃkhya means by "Nature," but it seems to me to be somewhat akin to the "Material Substance" of Western thought. It is, at least, entirely different from "Spiritual Substance," since Nature and Soul are kept perfectly distinct. As for Soul, it is regarded as the origin of perception and of thought; its function is to know and to think. Although it has been said that Nature produces the manifold of things, the Soul remaining unproductive, yet it is not until Nature becomes united with Soul that its productivity is realized. The union of the two is compared to a lame man (of good vision) mounted on the shoulders of a blind man (of sure foot).[1] The relation between Nature and Soul is not unlike that which Aristotle conceives to exist between Matter, the Potential, and Form, that which brings the Potential into actuality. Nature is blind, but with the guidance of Soul it can produce the manifold world. Thus all the psychic functions, sensation, feeling and will, together with the five elements of the Universe, are the products of Nature "illuminated" by Soul. To lead one to a true knowledge of Nature, such as these twenty-five principles are supposed to represent, is the object of the Sāṃkhya Philosophy, "for true knowledge of these principles delivers man from his pain,"[2] *sci.* (1) from internal or mental pain, (2) from external pain, (3) from natural pain, such as heat, cold, etc.[3]

It will be seen that the Sāṃkhya Philosophy is dualistic; Nature and Soul are its two ultimate terms. And these are real; they are eternal substances. The Philosophy is, further, pessimistic; its object is to deliver man from the pain of the world. To logic, however, its only contribution is the doctrine of the three sources of knowledge. These became in the later schools the sources of indisputable truth, and the grounds of reasoning.

[1] Kin Shichiju Ron, 1:21.
[2] Kin Shichiju Ron, 1:3.
[3] Kin Shichiju Ron, 1:16.

II. The Yoga Philosophy of Patañjali.

If we were to classify Indian Philosophy as transmitted through the Chinese and Japanese literature upon the basis of the views maintained respecting the nature of the ego, we should find perhaps eight or nine different schools. Among these, one, called the "Soh-oh Gedoh" (literally, the "mutual relation heresy,") corresponds to the philosophical school denominated by Western scholars as the Yoga. Its doctrines, however, are quite different from those of the Yoga sect of Buddhism. According to Jushinhinso [1] it maintains "the principle of the mutual relation of the internal mind" to be the true ego. The meaning of this expression is far from clear, and the information to be derived from our sources is extremely limited, for this school corresponds to no one of the six schools of philosophy which are mentioned in the Chinese or Japanese classification. It is referred to, however, by Ryuju in his Hohben-shin-ron,[2] from which we may assume that the school was already in existence at 200 A. D.[3] The metaphysical basis of the Yoga is the Sāṃkhya; indeed, the former is commonly regarded as a branch of the latter. Its practices appear to have been ascetic, and its votaries to have struggled after mystic powers.[4] It contributes nothing to our knowledge of Hindu logic.

III. The Mīmāṃsā of Jaimini.

The Mīṃāmsā holds that sound is eternal, since every word of the Veda which was once uttered by the Supreme Heaven must forever be true. In our literature [5] this school seems to be divided into two sects, (1) that which holds that indi-

[1] Jushinhinso, 4:71.

[2] Vid., § 4.

[3] Professor Garbe thinks Patañjali lived in the second century B. C. See Die Sāṃkhya Philosophie, 111.

[4] Vid. the Yoga-sūtra of Patañjali, translated into English by Ballantyne and Deva.

[5] Hoh-en Gi-kyo, 1:4.

vidual sounds become manifest by some accident, but that sound itself is eternal, without beginning and without end; (2) that which holds that sounds come into existence through some cause at a point of time, but that, having come into existence, they continue eternally. Thus they were all busied with the interpretation of the Veda, contributing little to the development of philosophy,—nothing to the growth of logic.

IV. The Vedānta of Bādarāyaṇa.

It is rather hard to determine which school in the Chinese classification corresponds with this. In Ishiki,[1] however, it is said that the "Intelligence school" (in the Chinese system) holds to the eternity of sound, and moreover, in one of its commentaries the word "intelligence" is said to be a translation of the Sanskrit "Veda."[2] Thus both in name and doctrine the "Intelligence school" of the Chinese approaches most closely to the school of the Vedānta (also called Uttara-mīmāṃsā) for which the chief authority is Bādarāyaṇa. Its first principle is the unity of the self and the Brahman; but, so far as our sources inform us, it makes no inquiry into the nature of reasoning. It contributes, therefore, nothing to the development of logic.

V. The Vaiçeshika of Kaṇāda.

Some difference of opinion seems to exist as to the chronological relations of the Vaiçeshika and the Nyāya. Garbe[3] holds that the Vaiçeshika is of the greater antiquity, while Mitchell[4] thinks that it is merely an expansion of the Nyāya. The two schools are quite similar, and our sources do not permit us to settle the question of priority. There is some indication, however, that Garbe's view is the right one, for it is said that

[1] Ishiki, 1:14.
[2] Ishiki Jutsuki, 1:75.
[3] Die Sāṃkhya Philosophie, 116.
[4] Hinduism, Past and Present, 59.

Hindu logic, which is peculiar to the Nyāya philosophy, was begun by one Akshapāda (eye-foot); and we shall hereafter find some reason for placing this author later than the Vaiçeshika development.[1]

Kaṇāda (rice-eater)[2] is also called Aulūkya (a kind of monkey),[3] as well as Akshapāda. His date cannot be ascertained from our sources, but it seems certain that he was considerably later than Kapila, the founder of the Sāṃkhya.[4] Kaṇāda gives us six categories, by the unity of which the world becomes manifest and by the separation of which it becomes nothing.[5] There are (1) Substance, (2) Quality, (3) Action, (4) Generality, (5) Particularity, (6) Harmonious Unity. They are sharply defined and subdivided into subspecies.

A later philosopher, Chandara, by expanding the fifth and sixth categories, and by adding one of Non-existence, was able to establish ten categories, his treatise on which is our chief source of information respecting the present school.[6] The relation between the original and the expanded categories is as follows:

Six Categories	Ten Categories.
Substance	Substance,
Quality	Quality,
Action	Action,
Generality	Sameness,
Particularity	Difference, Non-productivity, Particularity,
Harmonious Unity	Productivity, Unity, Non-existence,

Kaṇāda does not confine himself to a mere enumeration of these categories. He proceeds to discuss them and to apply

[1] Great Commentary (G. C. will be used hereafter), 1:2; *vid.* pp. 21, 27.

[2] Ishiki Jutsuki, 1:39.—He used to go out and get rice from women.

[3] Ishiki Jutsuki, 1:39.—He lived in the mountains like a monkey; he is also said to have been extremely ugly, looking like a monkey.

[4] Immyo Kohki, 2:18; Hyakuronso, 2:18.

[5] Jionden, 4:19; Hyakuronso, 1:26.

[6] A Chinese translation by Hiuent-sang, Jukkigi-ron.

them to the solution of various problems, and thus to work out a comprehensive view of the world. His account of them may be summarized as follows :

Substance, that is, the substratum.—It is "the real (not apparent) body and substance of things."[1] There are nine species of it : (i) Earth, (ii) Water, (iii) Fire, (iv) Wind, (v) Space, (vi) Time, (vii) Direction, (viii) Soul, (ix) Mind.[2] From these Kaṇāda develops an atomic theory of the world.

Quality.—It is defined as "the (outer) sign of substance," of which there are twenty-four kinds : Color, Taste, Smell, Touch, Number, etc.[3] Thus the category of Quality affords our author the basis for the further development of his epistemology and psychology. Of these the most interesting to us is his treatment of the "Understanding." It is divided into two kinds, (*a*) Sensation, obtained when the mind comes into contact with things ; (*b*) Inference, which is either the comparison between things of the same kind (*e.g.*, to know one cherry by comparing it with another), or comparison between things of different kinds (*e. g.*, to infer from a dark cloud the coming rain).[4] But the science of reasoning was not highly developed in the Vaiçeshika school : the attention was directed to other matters. It was the Nyāya philosophers who accepted the Vaiçeshika categories and went on to develop the theory of inference.

Action or Motion.—(i) Taking, (ii) Casting, (iii) Contracting, (iv) Expanding, and (v) Moving (of the entire body).[5]

These three categories of Substance, Quality and Action are the first principles, and the rest of the categories, like Sameness, Difference, Unity, Productivity, and so on, are such as the Stoic would put under the category of Relation.[6]

[1] On Ten Categories, 1.

[2] Jukkugiron Kettaku, 1:36 *seq.*

[3] Jukkugiron Kettaku, 3:1 *seq.*

[4] Jukkigiron Kettaku, 3:3.

[5] Jukkugiron Kettaku, 3:24 *seq.*

[6] Cf. the Stoic categories of Substance, Quality, Condition and Relation.

VI. The Nyāya of Gautama.

The sixth and last of the great systems is an outcome of the Vaiçeshika philosophy. It is often assumed that the word "Nyāya" means "logic,"[1] but in truth "Nyāya" means "rule," "norm," or "right way."[2] It is the name of a philosophical school which holds the principle that the attainment of the highest bliss depends upon the grasp of true knowledge,[3] a doctrine somewhat similar to the Socratic identification of Virtue and Wisdom. The right way of attaining to truth was especially studied by this school. It had a perfect syllogism and a well-developed theory of inference. The school has a special place in the development of Hindu philosophy, and the name "Nyāya" became more or less exclusively associated with the doctrines of logic, which occupied the highest place in this philosophy. It is this famous Nyāya logic which I shall try to expound and criticise in the present monograph.

Two more schools are frequently included by Chinese and Japanese authors among the great ones. They are called Nikendabtra and Ashibika and are quite similar to each other. They both hold that the penalty of a sinful life must sooner or later be paid, and since it is impossible to escape from it, it is better that it be paid as soon as possible so that the life to come may be free for enjoyment. Thus their practices were ascetic,—fasting, silence, immovability, or the burying of themselves to the neck,[4] were their expressions of penance. They were probably off-shoots of the Jainist or of some other Hindu sect.

In this very brief way I have tried to set forth the development of Hindu philosophy as recorded in our Chinese and Japanese

[1] *e. g.*, Sarva-darçana-saṃgraha, Eng. trans. of Gough & Cowell, Sec. Ed. London, 1894, p. 164. From this and other such sources European writers often use the word "Nyāya" in the place of "Hindu Logic."

[2] G. C., 1:3.

[3] Sarva-darçana-saṃgraha, Eng. trans., 161; see Nyāya-sūtra.

[4] Hyakuron-so, 1:22.

sources. These records are, as already pointed out, quite meagre, and the reader who wants to learn more of the philosophical systems must go back to the original Sanskrit. It is not my intention in the present monograph to seek information from other sources than the Chinese and Japanese. The account here given will, I hope, serve as an introduction to our more special study of Hindu logic.

We have seen that we must turn to the Nyāya school for our logic. In the later days, however, other schools also turned their attention to logic, and it became a part of the educational systems. Just as there are the *septem liberales artes* in the Scholastic cloister-schools, and the "six arts" in the Chinese classification of studies, so there were the five departments of learning in the schools of ancient India.[1] They were *Çabda-vidyā* (Sei-myo, the science of Sound), *Hetu-vidyā* (Im-myo, the science of Reasoning), *Adhyātma-vidyā* (Nai-myo, the science of Essence), *Cikitsā-vidyā* (Ihoh-myo, the science of Medicine), and *Çilpa-vidyā* (Kohhoh-myo, general arts.)[2] It is with the second of these that we shall have to deal in this essay.

[1] Sai-iki-ki, 2:6.

[2] Such as agriculture, commerce, architecture, music, fortune-telling, magic, etc.

PART I. HISTORY OF THE DEVELOPMENT OF HINDU LOGIC.

Chapter I. Development of Logic in India.

§ 2. *Çākya's Date.*—In curious contrast to the ancient Hindu's love of subtle subdivision stands his failure to appreciate the value of dates. Chronological obscurity[1] in the records of Hindu literature, religion and philosophy is the greatest obstacle that lies in the way of our present investigation, and whatever traces there may have been of an historical development in the Hindu originals, these are completely lost in the Chinese and Japanese translations. Hence we can get no pure history of the Hindu people and their civilization from these sources. We must rest content with a few myths which the Chinese and Japanese monks have handed down from Hindu tradition and have embodied in their work. Yet I do not regard it as entirely hopeless to arrive at some approximation to the few dates necessary to this sketch. The comparison of events in China with those in India will assist us, for it is certain that the records of Chinese culture are quite ancient, even though we do not take seriously the date 2500 B. C., sometimes mentioned, as marking a period at which they were in possession of mathematics, astronomy, a calendar and a chronology. Every event of Buddhist literature is referred to the date of Çākya's entrance into Nirvāṇa, just as Christian chronology is referred to the year of the Incarnation. It is therefore important that we should first of all obtain some idea of the date either of the birth or of the death of Çākya.

To do this with exactness is difficult or perhaps impossible; there are almost as many dates proposed as there are authori-

[1] Sohsiryak, 1:1 complains of this also.

ties that refer to the period of Çākya's birth. One fixes the twenty-sixth year of the Emperor Buotru of the In dynasty (about 1030 B. C.); a second, the twenty-fourth year of the Emperor Shoh of the Shu dynasty (1014 B. C.); a third, the forty-eighth year of the Emperor Sen (780 B. C.); a fourth, the forty-eighth year of the Emperor Hey (723 B. C.); a fifth, the fifth year of the Emperor Kwan (715 B. C.); a sixth, the tenth year of the Emperor Soh (687 B. C.); and a seventh, the second year of the Emperor Teitei (457 B. C.). Thus our choice may range from 1030 B. C. to 457 B. C. Chinese authorities generally prefer the twenty-fourth year of the Emperor Shoh (1014 B. C.), but since there are four of our sources that give dates lying around 700 B. C., namely, 780, 723, 715 and 687, I take it that this is the safest approximation we can make to the date of Çākya's birth; and since only two suggest dates later than 700 B. C., namely, 687 and 457, it is more likely that the date was earlier than 700 B. C. than that it was later. We must remember that the Chinese official chronology is questioned by the best Chinese scholars, and differs from the popular chronology by about 200 years.[1] We may then, so far as averages mean anything in such matters, take the real date to be about 500 B. C., or perhaps a little earlier, and this corresponds with the recent investigations of Western scholars.[2]

§ 3. *Rise of Logic.*—The author of the Great Commentary says: "Logic was first originated in Çākya's teachings."[3] This may possibly mean in the teachings of the Buddha in his pre-existence, that is, before his incarnation in this world, but it may be taken merely as an instance of the Buddhist's characteristic pretension to find all beginnings in the Buddha. Or, one may think that the writer has confounded Buddha with the founder of the Nyāya philosophy, both bearing the name Gautama,

[1] Eitel's Hand-book of Chinese Buddhism, 114.

[2] Weber's Hist. of Sansk. Lit., Eng. transl., 287. H. C. Warren's Buddhism in Translations, 3.

[3] G. C., 1:2.

a rather common one among the ancient Hindus. By all Hindu logicians, however, it is accepted that "in the beginning Socmock set the criteria of truth and of untruth."[1] Who this Socmock was, or when he lived, our sources do not tell us; it is only said "in the beginning," which we may refer to some remote period in the history of India. By some commentators he is supposed to be Kapila, the founder of the Sāṃkhya school; by others to be Kaṇāda, the founder of the Vaiçeshika school; and many other views[2] are entertained respecting his identity, but these are the merest guesses, equally without foundation.[3] All that we can say is that Socmock must have been a learned Brahman who lived many a century before Çākya, and whom we may call the founder of Hindu logic.

Socmock is said to have been the first to establish the "criteria of truth and of untruth." The results of his teachings on these subjects are known as the "Nine Reasons." Under this head we have an examination of the relations that *can* exist between the predicate of the thesis and the predicate of the reason given to support the thesis. The examination is made with a view to selecting the relations that *must* exist if the reason is to be valid. It is, then, with the relative extension,—as we should now call it,—of the two terms that Socmock has to do.

[1] G. C., 1:2.

[2] Sankwai-kokoh, Vol. I, App. p. 5 *seq.*, gives six different views, or rather guesses.

[3] Our own preference would be for the following conjecture. Socmock (foot-eye), the name found in Chinese and Japanese literature as that of the author of the Criterion of Truth and Untruth, is probably an inversion of Mocsock. In this form it would be a literal translation of the Sanskrit "Akshapāda" (eye-foot). In the Sarva-darçana-sāṃgraha, Mādhavācārya gives to the chapter on the Nyāya system the title "Akshapāda (or Nyāya) darçana" (Cowell & Gough, 2d ed. p. 161). This would tend to identify Socmock with the founder of the Nyāya system, better known under the name of Gautama. It is to be remarked too that the Chinese and Japanese writers were well aware that Socmock was not the proper name of the man in question, but a sort of nick-name. (Sankwai-Kokoh, Vol. I, App. p. 5 *seq.*)

With respect to the possession of any attribute (A), the universe is divided into the things that do and those that do not possess it; into A's and non-A's. The classification in Hindu logic is always based upon the principle of exhaustive division, and is exclusively a process of dichotomy. The A's let us say, are homogeneous with and the non-A's heterogeneous from each and every A. So much being clear, the question that presented itself to Socmock was this: In order that the term attributed to a given subject may serve as the ground for attributing another term to the same subject, what relations of heterogeneity and of homogeneity must exist between the two terms? If, *e. g.*, to support the thesis "this mountain is fiery," the reason be given "because it smokes," what relations of homogeneity and heterogeneity must exist between fiery things and smoky things in order that to be a smoky thing shall involve being a fiery thing? Socmock begins with an enumeration of all the relations that can possibly exist between the predicate of the thesis and the predicate of the reason, regarded simply as terms. He finds them, after excluding the self-contradictory and superfluous, to be nine in number, namely:

<table>
<tr><td rowspan="9">Things denoted by the predicate of a Reason consist of</td><td>(1) *all* things homogeneous with
and *all* things heterogeneous from</td><td rowspan="9">things denoted by the predicate of a Thesis.[1]</td></tr>
<tr><td>(2) *all* things homogeneous with
and *no* things heterogeneous from</td></tr>
<tr><td>(3) *all* things homogeneous with
and *some* things heterogeneous from</td></tr>
<tr><td>(4) *no* things homogeneous with
and *all* things heterogeneous from</td></tr>
<tr><td>(5) *no* things homogeneous with
and *no* things heterogeneous from</td></tr>
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and *some* things heterogeneous from</td></tr>
<tr><td>(7) *some* things homogeneous with
and *all* things heterogeneous from</td></tr>
<tr><td>(8) *some* things homogeneous with
and *no* things heterogeneous from</td></tr>
<tr><td>(9) *some* things homogeneous with
and *some* things heterogeneous from</td></tr>
</table>

[1] Dvāra-tāraka-çāstra (D. Ç. will be used hereafter). Sankwai-kokoh, 3: 28.

Socmock now attacks the problem of selecting from among these nine possible relations, those which must exist if the reason is to be valid. In Aristotelian logic the right to regard the statement "This mountain is smoky" as a reason for asserting "This mountain is fiery," would depend upon the truth of a major premise, "All smoky things are fiery." We could equally well express this premise by saying, "There are no smoky things that are not fiery." Translated into the language of Socmock, we have a right to say, "A is B, for it is C," if C denote nothing that is heterogeneous from B, whether or not it denote all things homogeneous with B,—that is, whether or not there be a B that is not a C. There are, then, three of the conditions enumerated by Socmock that correspond to the statement "There are no C's that are not B's," namely, the second, the fifth and the eighth. From these the fifth is excluded, for we not only deny that any C is B, but also deny that there is any C; so that, finally, Socmock concludes that only the second and the eighth conditions in the above enumeration are valid relations existing between the predicate of the reason and the predicate of the thesis.[1]

Socmock then goes on to the doctrine of the Fallacies. Of these he makes fourteen varieties, as follows:[2]

1. *Fallacy of Homogeneity*, which arises from mistaking

[1] Illustrations in the Aristotelian form of syllogism corresponding to these conditions would be the following:

"Cæsar is mortal, for he is a man.
No men are not-mortal (that is, all men are mortal)."

In this syllogism, the predicate "man" of the Reason contains no things heterogeneous from the predicate "mortal" of the Thesis, although it does not contain all things homogeneous with mortals. This is the condition represented by Class 8 of Socmock's list.

"A triangle is a three-sided figure, for it has three angles.
No three-angled figures are not three-sided (that is, all three-angled figures are three-sided)."

In this example the class denoted by "three-angled figures" not only includes no cases heterogeneous from "three-sided figures," but also includes all cases homogeneous with "three-sided figures." It falls within Class 2.

[2] D. Ç., 20 *seq.*; Zui Gen Ki, 8:46–51 (Z. G. will be used hereafter).

heterogeneous things for homogeneous things,—for example, when Space is taken to be homogeneous with Sound, so far as their "producedness" is in question.

2. *Fallacy of Heterogeneity*, which is the reverse of the preceding. These two fallacies are due to wrong classification and may result in many kinds of mistaken judgment.

3. *Fallacy of Division.*—This arises when an accident of a thing is taken as a basis for classification. This accident of circumstances may have led one to place a thing in a class which is homogeneous with or heterogeneous from the thing with respect to which we classify. Such classification should have reference exclusively to the essential qualities of the thing, those by virtue of which a thing is what it is.

4. *Fallacy of Non-Division*, arising from the failure to seize that peculiarity of the thing by virtue of which it belongs either to the homogeneous or to the heterogeneous class with respect to another thing. These two fallacies are closely related to each other. They may perhaps be distinguished as "the sin of commission," and the "sin of omission."

5. *Fallacy of Possibility.*—Such a fallacy is committed when a good reason is taken to be fallacious simply because another entirely different reason can equally well be given for the support of the same thesis. This fallacy arises from the assumption that only one reason can be given for a thesis.

6. *Fallacy of Hesitation.*—This fallacy is to be regarded as one of method, and is committed by any one who hesitates to advance a reason because of its unpopularity, or because of the supposed inability of his hearers to grasp its meaning. The fallacy implies an overestimation of the value of popular approval.

7. *Fallacy of Conversion.*—The refutation of a thesis by an illogical conversion of the opponent's reasoning.

8. *Fallacy of Unity and Separation.*—This fallacy arises from the confusion of the inseparability of two attributes with their identity. Thus it may be argued, "Sound is non-eter-

nal because it is produced," and the fallacy in question would be committed if one were to argue "The producedness of a thing is inseparable from its non-eternity, therefore the reason advanced is only the thesis repeated and the argument is an attempt to prove the thesis by itself."

9. *Fallacy of No Reason.*—One commits this fallacy if one urge as a refutation of any argument, that if the reason exist before the thesis it cannot be a reason for the thesis which is not yet in existence; if it exist after the thesis, the thesis could have existed without this reason, or if both the thesis and the reason exist at the same time, yet the thesis does not need the reason for its existence. Such an argument fails, in the first place, to distinguish between the time at which the judgment is made and the time to which it refers, and in the second place, between the sense in which the judgment itself is a reason and the sense in which that to which it refers is a reason.

10. *Fallacy of Utterance*, arising from a confusion similar to the preceding, and arguing that if the thesis is to be proved by the given reason, then the thesis was not valid before the reason had been uttered.

11. *Fallacy of Non-existence.*—To argue that the thesis may be true, but that before the objective existence of the thing mentioned as the subject of the thesis is proven, the truth of the thesis cannot be demonstrated.

12. *Fallacy of the Product.*—This is the special fallacy committed in arguing against the Vaiçeshika's reason for the non-eternity of sound,—the reason, namely, that it is a product, like a pot. The fallacy argues that the case of the pot is different from that of the sound, and that consequently the non-eternity of the sound cannot be proven from analogy with a pot.

13. *Fallacy of the Example.*—To attack the validity of the example, failing to recognize that the validity of the thesis does not necessarily depend upon this,—a kind of *ignoratio elenchi.*

14. *Fallacy of Eternity.*—A certain fallacy committed in an attack upon the Vaiçeshika's reasoning concerning the non-eternity of sound. "If," this fallacy argues, "non-eternity be an attribute of sound, it must be so forever, and since sound would in that case have an eternal attribute, sound itself would necessarily be eternal."

Such is a brief account of the Nine Reasons and Fourteen Fallacies recognized by Socmock. It would not, I think, repay us to follow the long expositions of our sources, and I shall pass on to the next stage in the development of Hindu logic. Before doing so, however, it may be well to consider for a moment the claim that these doctrines have to represent Socmock's original thought. Although in following my sources I have treated them as the invention of Socmock, I nevertheless entertain grave doubts as to their authenticity. For, so far as I can find, there is no positive statement in the books of Hindu logic that Socmock originally propounded the Nine Reasons. The only intimation in our entire literature that such is the case, is a single passage (and that an obscure one), in the text of a Chinese author working at second hand. All later authorities depend upon this one passage for their belief that these doctrines stand for Socmock's teachings. The passage is the one already cited, "In the beginning Socmock set the criteria of truth and of untruth." "The criteria of true and of untrue reasoning!"—it can mean anything or nothing. As a matter of fact, if we are to believe that Socmock lived "in the beginning," which seems to imply a fairly remote antiquity, one must suspect the list of the possible reasons to be too complete and too logical for the intellect of that time. Think of the amount of reflection involved in the process of dichotomy, not to mention the completeness of the theory of inference required to detect the invalidity of the seven rejected reasons! Again, the Nine Reasons and the Fourteen Fallacies can hardly be accepted as the product of one and the same mind. The one is a highly finished product of a logical intellect, while

the other, as anyone can see, is a naïve and random selection of instances. And lastly, when Dinna speaks of both the Nine Reasons and the Fourteen Fallacies, he does not ascribe both with equal distinctness to Socmock.[1]

The phrase "in the beginning," so frequently referred to in this connection, is one cause of the difference of opinion between Eastern and Western scholars concerning the order of the schools of Hindu philosophy. It is generally taken by Chinese and Japanese writers to indicate that Socmock lived in the beginning of the history of India, and that the Sāṃkhya and Vaiçeshika schools developed after the Nyāya.[2] But it seems to me that the words of the Chinese author[3] simply mean to refer to the beginning of the science, and not to that of the country. For since, as we have seen, some of the Fourteen Fallacies are concerned with the disputation about the eternity of sound, which was a point at issue between the different schools, it is impossible that the author of these Fourteen Fallacies could have lived before these schools had developed. Still less possible is it that he should have lived at the very beginning of the country's history. It seems best, then, to interpret the phrase, "in the beginning" to mean in the beginning of the science, namely, of logic. We could then still maintain that the founder of the Nyāya school was the author of the Fourteen Fallacies without denying that the Nyāya philosophy was later than the other schools of philosophy. When we remember, as already pointed out, that the Chinese word Mocsock, not Socmock, is the literal translation of the Sanskrit Akshapāda, another name for Gautama, the founder of the Nyāya system, this interpretation seems all the more probable.

So then the study of human reasoning was begun by Gau-

[1] D. Ç., 34.

[2] Dr. Y. Inoue's Gedoh Tetsugaku, p. 276, also p. 132, 140, etc. Mr. S. Murakami's Lectures on Immyo, p. 2.

[3] G. C., 1:2.

tama, the founder of the Nyāya school. He is also known by the name of Socmock and, as I believe, he may be the author of the Fourteen Fallacies, but is not the author of the Nine Reasons.

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§ 4. *Further Development of Logic.*—Respecting the development of Hindu logic from the time of Socmock to that of Çākya, our Chinese and Japanese sources give us no information. In the Kwai-shin-mitz,[1] Çākya discusses the kind of evidence that can be accepted as proof. He distinguishes between "pure" (rational) and "impure" (irrational) reasons in the following lists:

I. Pure:

1. Intuitive facts (cf. the common phrase "seeing is believing");
2. Things to be known by common sense reasoning (*i. e.*, reasoning in which habitual associations are appealed to without explicit statement);
3. Analogy of homogeneous things;
4. The conclusion of a perfect syllogism;
5. Dogma: the teachings of holy men.

II. Impure:

1. An example which is an exceptional case in its homogeneity with the thesis, and also
2. in its heterogeneity from the thesis;
3. Heterogeneous things taken as homogeneous things, or
4. homogeneous things taken as heterogeneous;
5. An analogy taken from heterogeneous things;
6. The conclusion of a fallacious syllogism;
7. The dictum of the ordinary man (as opposed to the dogma of the holy man).

[1] Vol. V, p. 2 *seq.*

That Çākya was not a man of extraordinary intellect is admitted by all modern scholars. He appears to have been a man of warm heart,—a reformer concerned with the problems of social morals, not a metaphysician. We can scarcely expect at his hands a systematic, still less an original treatment of logic. Even his naming of these five correct and seven fallacious kinds of reasoning I take to be rather the reflection of the logical teachings of his time (the sixth century B. C.) than products of his own thought. Whether the work represents Çākya's individuality, or the type of thought of his time, it is worth noticing that we have here a decidedly practical logic, a *logica utens.* Also it is worth noticing that the first four of the seven kinds of fallacious reasoning are negative anticipations of Dinna's famous theory of Hetu.

About 700 years after Çākya (200 A. D.)[1] Ryuju is said to have preached the Mahāyāna doctrine of Buddhism with great success. Hoh-ben-shin-ron is one of his polemical works against heresies: it is also the work in which we find his treatise on logic. The gist of his teaching may be given in the following schematic form:

1. *The Example.*—Its use in reasoning is simply to help the understanding of the listener. Examples are either homogeneous or heterogeneous, either perfect or fallacious.

2. *Reasons.*—The correct reasons are four,—exactly the same as those given by Çākya, except that the fourth (syllogism) is omitted.[2] The use of the syllogism is, however, elsewhere recognized in his writings.

3. *Language.*—Its correct use is necessary to one who would be understood by all. Exaggeration or deficiency is to be avoided in the statement of the Reason, of the example and

[1] Hashu-kohyoh, 1: 2. The date of Ryuju is not beyond dispute, but this is the one generally accepted among the Northern Buddhists. Cf. Ryuju-den, 4:2; Kyoron-kwahim-shoh, 11:25; Gedo-tetsugaku, 279; etc.

[2] P. 15, § 4.

of the whole syllogism. When these cautions are neglected the reasoning is defective.

4. *Understanding.*—Intellect is necessary to the understanding of the reasons of others and to the ability to reason oneself.

5. *Order.*—Clear understanding of the thesis is largely dependent upon the order of the presentation of the reasoning.

6. *Fallacy.*—When a reason for a thesis is not one of the the four mentioned above, it is called a fallacy.

7. *Difficulty in Reasoning.*—When an argument is based upon a fallacious reason, there follows also some awkwardness in expression.

Such being the logic of Ryuju, we notice that with him as with Çākya the treatment is from the practical side. That experience in practical polemic on which Ryuju bases his work was particularly conducive to this result.

Mirok (Maitreya), about 900 A. Ç.[1] (400 A. D.), treats of Logic in his Yoga.[2] He, too, is principally concerned with practical questions, as witness the titles of his chapters, "Of Kinds of Debate," "Of Occasions of Debate," "Of the Attitudes of the Debator," "Of Defeat," etc., but mixed in with such discussions we find some pure logic. A thesis, according to Mirok, is to be supported by a reason and two examples. Validity of the reason and of the examples requires that they be based either (1) on fact, (2) on another inference, or (3) on holy saying. The analogy of Çākya and Ryuju is omitted. The Yoga treats also of the form of reasoning, of which the following is an illustration :

1. Sound is non-eternal,
2. Because it is a product,
3. Like a pot (but not like space) ;
4. A product like a pot is non-eternal,
5. Whereas, an eternal thing like space is not a product.

[1] Chinese translation Yuka Ron, Book XV.

[2] A. Ç. for After Çākya. For 900 see Immyo Zensho, 116.

An improvement on this form was attempted by Mirok's disciple, Muchak. Muchak (Asamgha) treats logic in the tenth volume of Genyo and also in the sixteen volumes of Zaschuh, expounding the teachings of his master, Muchak. Genyo seems to be the work of his younger days, and is an exact reproduction of the Yoga Logic, whereas Zaschuh shows a slight originality on the part of the disciple. The kinds of valid reasoning are exactly the same as those given in the Yoga, but the form of reasoning is somewhat different:

1. Sound is non-eternal,
2. Because it is a product,
3. Like a pot (but not like space);
4. Because a pot is a product it is non-eternal; so is sound, as it is a product:
5. Therefore, we know sound is non-eternal.

To be sure, if we look at the Yoga syllogism, the non-eternity of sound is proved by likening sound (on the basis of its producedness) to a pot, which is both a product and non-eternal, but it does not expressly state that producedness and non-eternity are essentially connected (*e. g.*, as cause and effect). The connection of producedness and non-eternity in the case of the pot might be accidental. The fact that the analogy of the pot is advanced as a Reason implies that the connection is a necessary one, but it does not explicitly say so. This could not satisfy Muchak, who, in the cause of clearness, at least, emphasized the essential connection between producedness and non-eternity by saying, "*Because* a pot is a product, it is non-eternal." In so doing the disciple appeals, not merely to an instance, but to a law. He assumes the universality of nature, in that he infers the connection between producedness and non-eternity to be a causal one, and in that he implies that only because this connection is a causal one can producedness be adduced as evidence of non-eternity. The basis of the Yoga inference, so far as it is expressed, is mere analogy founded upon a single instance.

Muchak, for the first time in the history of Hindu logic, clearly apprehended the principle of induction. It is to be regretted that the methods of induction were not further studied at this time.

Muchak had a younger brother, Seish (Vasubhandu), who has even overshadowed him in fame and in learning. He was the author of many books, and when Hiuent-sang was in India he saw three books on logic attributed to Seish, namely, Ronki, Ronshiki and Ronshin.[1] These, to the great regret of later logicians, he for some reason did not bring home with him; they are consequently lost. Seish in his Ronki as quoted by Kwei-ke,[2] maintained that a thesis can be proved by two propositions only, and that therefore the necessary parts in a syllogistic inference are only three. We regret very much that we cannot know further than this how far the theory of the syllogism was developed in the lost books. The only work that remains to us from which we can learn anything of Seish's logic is his polemic against heresies (Nyojits-ron). In this book he gives the following formula:

1. Sound is non-eternal,
2. Because it is a product of a cause,
3. Things produced by a cause are non-eternal, like a pot, which is produced by a cause and is non-eternal;
4. Sound is an instance of this (kind),
5. Therefore, sound is non-eternal.[3]

Such must have been the form of reasoning used in debate in those days, and since in this book Seish was not concerned with theoretical logic, and since Hindu logic is primarily practical in its purpose, we cannot disprove the statement of Kwei-ke by citing this formula. It is not, however, until we come to Dinna that we find the uselessness of two of the five

[1] Murakami's Immyo-jensho, 129. Dinna also speaks of this.
[2] G. C., 1:10.
[3] Nyojits-ron, 25.

propositions in the syllogism clearly and strongly insisted upon. With this insistence Dinna founded a "New System."[1]

§ 5. *The New System.*—Mahādiṅnāga (Dinna, as he is more frequently called in China and Japan) lived about 900 or 1000 years A. Ç. (400 or 500 A. D,).[2] In the introduction to the Great Commentary Kwei-ke says:[3] "Although Seish (Vasubhandu) treated logic fully in his Ronki and Ronshiki, yet the science is too deep for the ordinary mind. Then appeared Dinna Bodhisattva. He was one of the thousand Buddhas. Living in a mountain, he trained his powers of reflection. When he completed his work, expounding with the utmost skill the deepest principles, the mountain quaked, and the clouds glowed with color; the god of the mountain raised his feet with honor and reverence a hundred feet high and said, 'The Buddha has expounded logic for the first time since the Nyori (Çākya). The doctrine once lost in lamentable ruin has been rebuilt anew, magnificent, wonderful, just in the manner to meet the approval of the Holy Will (of Çākya). Let the people have the opportunity to learn the science of reasoning.'" This Buddhist myth tends to show how Dinna was honored by his own people as the great figure in the entire history of the science. He is said to have been a native of Andhara, in South India. We do not know under what conditions or with whom he studied logic, but he derived his logic from Mirok's Yoga.[4]

[1] The form of the Hindu syllogism given by Ballantyne, Max Müller and others is of this old kind. They seem to have taken their examples from the Nyāya-sūtra and other older works. The three-propositional syllogism was, however, invented later by Mahādiṅnāga, and it is this new and more perfect one in which we are interested in this monograph.

[2] Dinna, as he is generally called, is an abbreviation of Mahādiṅnāga. To make it Jina (a conqueror, in Sanskrit) is probably wrong (Bunyu Nanjoh in Tetsu-gaku Zasshi, 12:557). For the meaning of his name is sometimes given in Chinese as Tai-iki-ryu, Great-region-dragon (the title page of his Dvāra-tāraka çāstra, Chinese translation) which is *mahādiṅnāga* in Sanskrit.

[3] G. C., 1:2.

[4] G. C., 1:2, b.

The number of Dinna's works is said to have reached forty, but only one of his works in logic has been handed down to us, Immyo-seiri-monron (A Treatise on the Entrance to the Right Principle); *Nyāya-dvāra-tāraka-çāstra* is the original title. The work was translated into Chinese by Gijoh and and also by Hiuent-sang (Nos. 1223 and 1224 in the Ming Library). It is a very small work, containing only from twenty to thirty sheets in the different editions of the Chinese translations, but in this small compass he has accomplished a complete reformation of Hindu logic. The full exposition of the New System will be found in Part II of the present paper; here we shall merely note the revolution it effected, and in what sense its author is to be called "the Father of Modern Hindu Logic." The following may be considered his most significant reforms and contributions:

1. *Thesis.*—The proposition, the point of disputation, or the Thesis,[1] is a judgment, not the terms of a judgment.[2] Before Dinna there was some controversy as to whether the question is about the subject term or the predicate term.

2. *Reason.*—"The Reasons or premises," says Dinna, "must be known truths, or truths accepted by all."[3] This is an improvement on the old way of enumerating the kinds of reasons, in which "fact," "dogma," etc., are very ambiguous in their meaning and have no logical significance.

3. *Dogma.*—The sayings of holy men had, from the beginnings of Hindu logic, been treated as a good basis for reasoning, but Dinna once for all disallowed their validity.[4]

4. *Example.*—In Dinna's form of reasoning, a proposition corresponding to the major premise is introduced in a definite and coherent form, distinct from the analogical examples of

[1] The terms "Thesis," "Reason" and "Example," when used in their technical sense, will hereafter be printed with capitals.

[2] D. Ç., 1; G. C., 1:33.

[3] D. Ç., 4; G. C., 1:11.

[4] D. Ç., 17.

the previous logicians,[1] and emphasis is laid upon this premise rather than upon the analogical examples as furnishing the basis for reasoning.

5. *The Middle Term.*—The significance of the middle term (called Hetu) for inference and hence for the theory of reasoning, is for the first time discussed by Dinna,[2] and the result of his study is the famous doctrine of the "Three Phases of Hetu."

6. *Fallacy.*—Dinna treats the pure fallacies of reasoning, and dismisses verbal defects from his discussion of fallacies.[3] Also he completes the list of the fallacies and fixes their number.

Such are the main points of Dinna's reform in logic, and it is this new logic which will chiefly occupy us in the present essay. The syllogism of Dinna takes the following form:

Thesis.—Sound is eternal.

Reason.—Because it is a product.

Example.—All that is produced is non-eternal.

It will be seen that this syllogism is identical with the Aristotelian. The exact resemblance has given rise to the hypothesis that there must have been an historical connection between the Hindu and the Greek logic. Some plausibility is lent to this hypothesis by the fact of Alexander's visit to India, it being quite possible that Alexander and his associates may have carried the philosophy of India back to Aristotle. But now that we have seen that the Hindu three-propositional syllogism was not in existence before 400 A. D.[4] (for Dinna lived about 900 A. Ç.) it is quite impossible to suppose that Aristotle owed anything to the logic of Dinna. Even if we consider that 1000 A. Ç. or 900 A. Ç. represents Dinna's date in round numbers merely, and that we may take it for 700 (for any

[1] D. Ç., 15 *seq.*; G. C., 3:3 *seq.*

[2] D. Ç., 3, 8, 10, 12, 14–16, etc.; G. C., 2:6 *seq.*

[3] D. Ç., 2, 4, 13 *seq.*

[4] Even if the Chinese chronology be correct the date could not be earlier than 200 A. D.

less than 700 would in round numbers be represented by 500) yet it carries the date back only to the beginning of the Christian era, and there is still 300 years between Dinna and Aristotle. If Alexander brought home any Hindu logic at all, it can at best have been Mirok's reasoning by analogy. For, although Mirok lived about 200 A. D., it is possible that the form of reasoning portrayed by him may have existed at an earlier time, but it is unlikely that any more developed form preceded it. But such reasoning by analogy Aristotle could have borrowed in a much better form from Plato, Socrates and the Sophists. It is absurdly unnecessary to suppose that he went to the Far East for his examples of this kind of reasoning. So far as there is any question as to the general connection between Indian and Greek philosophy the later Pythagoreans may have been influenced by the Sāṃkhya, but of any influence of the Nyāya upon Aristotle's logic, there can be no question.[1]

There are in Chinese two most important and fundamental works on logic. One is Dinna's work mentioned above, and the other is Hiuen-tsang's translation of a work by a disciple of Dinna, Çaṃkarasvāmin.[2] As the title ("Introduction to the Treatise on Nyāya Logic") indicates, the book was intended to be an introduction to Dinna's work. It is from this source that we gain our knowledge of Çaṃkara's logic. The treatment which logic received at the hands of Dinna left very little to be added by Çaṃkara. Hindu logic reached its zenith with Dinna, and his successors confined themselves for the most part to commentary. Çaṃkara was no exception to this rule, but his extraordinary intellect and ability raise him above the rank of commentators and give him a certain individuality. His relation to Dinna is not a little suggestive of the relation of Porphyry to Aristotle.

Dinna taught that the Thesis as a whole proposition is the mat-

[1] Vid. Note VII.

[2] The Chinese title of the work is Immyo-nyu-sehri-ron. Ming Library, No. 1216.

ter in dispute, not its subject merely nor its predicate. Çaṃkara developed this teaching with much greater clearness,[1] and on the basis of this doctrine detected some fallacies which we shall have occasion to examine later. His analyses and comparisons are sharp and accurate ; his expression of them distinct and pithy. His work is evidently the product of a clear and incisive intellect. It is not too much to say that Dinna's teachings could never have been so widely known had not Çaṃkara given them such clear exposition, nor, as we shall see, is his work entirely without original features.

After Dinna and Çaṃkara very little can be traced in the Chinese and Japanese literature concerning the history of logic in India. According to the tradition of North Hall of the Monastery of Kohfuk-ji, in Japan,[2] logic was handed down by Dinna through Çaṃkara, Gohoh,Tok-keh, An-keh, Shinshoh, Nanda, Jogwetz, Kwabenn, Shoyu, Shoshi and Chigettz, to Kai-ken, whose Sanskrit name is Çīlabhadra, a famous, priest of Nālanda the greatest scholar of his time (625 A. D.) and the favorite master of the Chinese sage Hiuen-tsang. It would seem that logic made no progress in India during this period, for the logic which Hiuen-tsang brought back to China is the logic of Dinna and Çaṃkara, and had anything new been developed he would, of course, have brought accounts of it back with him. It would appear that exactly as medieval philosophy in Europe became the instrument of Christian theology, so the function of Hindu logic during this period was to serve as handmaid to the Buddhist theology.

[1] P. Ç., 5–6.

[2] Kitabatake's Immyo-benyo, 1.

Chapter II. Introduction of Logic into China and Japan.

§ 6. *Logic in China.*—The history of Hindu logic in China begins, as we have said, with its introduction by Hiuen-tsang. Of this sage the Great Commentary[1] gives us the following account: Born in 600 A. D., he appears to have spent his youth in diligent study. At twenty-eight years of age he was seized with the ambition to go to India to continue his logical studies. Having asked permission of his governor, and having been unable to convince him of the necessity of such a journey, he was refused. Still clinging to his purpose, he ran away in the second year of Tei-Kwan of the T'ang Dynasty (628 A. D.), and traveled westward. When he came to Kaçmīra, in North India, he met Samkhya-yasha (Shyu-shoh, in Chinese), who, though then in his seventy-first year, filled with the joy of having obtained a heavenly genius, opened special courses of lectures upon several subjects; among them was logic. His estimate of the ability of the young Chinese seems to have been very high: "The power (intellectual)," he said, "is unusually strong, and the sight (mental) exceptionally clear: a genius who has the ability to succeed Vasubhandu and Mahādiññāga."

After this Hiuen-tsang went to Middle India. In Makeda (Nālanda?) he went to see Çīlabhadra (Kai-ken, with whom he stayed five years and whose lectures he attended. Then he came to Prajinabhadra, in the Monastery of Tilataka, with whom he stayed for two months, going then to Jayasena (Shoh-gun), who was well known for his knowledge of the heretical classics no less than for his intimacy with the Vedas. With him Hiuen-tsang stayed about two years[2] and completed his education.

[1] G. C., 1:1, 3; Z. G., 1:6 *seq.;* also Sai-iki-ki, Jioj-den, Seki-kohsoh-den, etc.
[2] Weber makes his stay in India 629–645: Hist. Sansk. Lit. 300.

After sixteen years' absence he came back to China in the nineteenth year of the Tei-kwan, and arrived at his home on the twenty-fourth of the first month. From the fifth month of the same year he began to translate some 657 Sūtras and Çāstras which he had brought back with him from India. This he did while dwelling in the Monastery of Kohfuk-ji, and at the imperial request. On this work he was engaged for nineteen years, until the tenth month of the third year of the Ryusak (663 A. D.), completing the translation of seventy-four Sūtras and Çāstras, the translation of the Hetu-vidyā Nyāya-praveça-tāraka-çāstra being dated the sixth of the eighth month of the twenty-first year of the Tei-kwan. On the fifth of the second month of the following year, the first year of the Riutok (664 A. D.), he died in the Gyokkwa Temple, sixty-four years of age.

Among the disciples of Hiuen-tsang the greatest logician is Kwei-ke. With Dinna's Çāstra on the one hand, and the notes from Hiuen-tsang's lectures on the other, he wrote six volumes of commentary on Çaṃkara's Praveça çāstra. This is the standard Chinese work on Hindu logic: it has since come to be known as the "Great Commentary."

Bunki, Seimai, Bumbi, Shintai and Jogan were contemporaries of Kwei-ke, and also wrote valuable books on logic, but they were overshadowed by the fame of Kwei-ke's "Great Commentary."

Among Kwei-ke's disciples was Kei-shoh, who wrote Gidan and Sanyou in criticism of the then existing commentaries on logic. His disciple Chi-shu wrote Zenke and Kwoke, explaining and commenting upon the literal and technical meanings of terms used in the "Great Commentary." After these men there followed a long series of monks well known in logic; for example, Douyu, Dohkwan, Taiken, Seikwa, and others, who contributed to the development of Chinese Buddhism and its theology, but are not of sufficient importance to deserve detailed mention.

§ 7. *Logic in Japan.*—In the reign of the Emperor Kohtok a Japanese monk, Dohshoh,[1] went into China (653 A. D.) to study theology. There he stayed for three years. It was just after Hiuen-tsang had returned from India, and the translation of the new Sanskrit scriptures was going on in the imperial monastery. The fame of the learned scholar was growing from day to day, and young monks were swarming around him from every quarter of the empire. So Dohshoh also went to Hiuen-tsang and studied with him. After his return to Japan in 656 A. D. he lectured in the Monastery of Genkohji of Nara, his teachings received the name of the doctrine of the South Hall.

Five years later than Dohshoh, in the fourth year of the reign of the Emperor Genseh (658 A. D.), Chishuh and Chitatsu went to China also to study theology, and brought back further information concerning Hindu logic.

In 703 A. D., the third year of Tsihoh of Emperor Temmb, Chihoh with Chiran and Chiyuh went to China and brought home the "Great Commentary," together with other books.

Of Chihoh there were many disciples, the most distinguished being Giyen. Of Giyen there were seven distinguished pupils, Gemboh, Gyohki, Senkyo, Ryobih, Gyotatsu, Ryuson and Ryohhen.

When Gemboh became full of ambition and went to China, thirteen years later than Chihoh, in the second year of Reiki of Emperor Gensei (716 A. D.), Chishu, the master of Chihoh, was still teaching. So under Chishu he studied, and when he came back he brought the "Great Commentary" and other works on logic. His lectures in the Monastery of Kohfuk-ji, of Nara, were known as the teaching of the North Hall.

Both at the North and South Halls logical and other sci-

[1] Kitabatake's Benyo, 2; Murakami's Immyo, 153 *seq.*

ences were much studied, Myosen, Zenshu, Shinkyo, Genshin, Zohshun and others being the later masters of logic at the Halls.

Such is the history of the introduction of Hindu logic into China and Japan. To give a clear view of the succession of the logical masters, I offer the following table :

Samkhya-yasha　Çīlabhadra　Prajinabhadra　Jayasena

- Hiuen-tsang
  - Kwei-ke and others
    - Kei-shoh
      - Chi-shu
        - Douyu
Dohkwan
Taiken
Seikwa, etc.
(In China.)
        - Gemboh and six others (North Hall, Japan.)
        - Chihoh and two others
          - Giyen
            - Gemboh and six others (North Hall, Japan.)
  - Dohsoh
  - Chishuh and Chitatsu (South Hall, Japan.)

PART II. THE LOGIC OF MAHĀDIÑNĀGA.

Chapter I. General Plan.

§ 8. *Divisions of Dinna's System.*—The logic of Dinna and Çaṃkara we have seen to be the best developed system of Hindu logic, and it is with this that we are chiefly concerned in the present monograph.

Before Dinna we have found a lack of systematic treatment. It is a system, then, which Dinna developed and which Çaṃkara perfected. Çaṃkara says in the beginning of his work,[1] "Demonstration and refutation and their respective fallacies are used in argument with a second person, while intuition, the secondary idea and their respective fallacies are for self-understanding,—such is the logical principle of all ancient authors." That is, from the point of view of the debater, he divides all arguments into two kinds,—(1) those which are addressed to another for the purpose of convincing, and (2) those which one uses in one's own thought for the purpose of winning to certainty. Each of these two is subdivided into four, making in all the so-called "Eight Great Divisions." These are:

1. *Demonstration.*—Proof is necessary when others do not understand or believe an assertion. Therefore the reasoning to convince an opponent is one kind of argument. This is called demonstration.

2. *Refutation.*—Disproof of an assumed thesis, or at least a mere destruction of proof, is another kind of reasoning. But apart from the point of view of debate there is no difference between this and the preceding type. It is only in practical logic that such a distinction would be made.

3 and 4. *Fallacies.*—A disputant is liable to make a fallacious argument in both of these processes; and Çaṃkara has

[1] P. Ç., 3-4.

treated the two kinds separately, the so-called "Socmock's Fourteen Fallacies," being fallacies of refutation.

5. *Intuition.*—When one receives an impression, external or internal, one has knowledge in its first stage,—one has an intuition. Intuition is the first step to the understanding of the world or of self, and intuition can be advanced as a reason.

6. *Secondary Idea.*—When a pure sensation or impression is made the material of mental activity, so that its form is changed, it is called a secondary idea. Of this we shall speak in detail later.[1]

7 and 8. *Fallacies.*—These last two are also subject to fallacies or misunderstandings.

Such are the general divisions of the treatment of logic by Dinna and Çaṃkara, and we shall follow their order as closely as may be in the following treatment of their system.

[1] Vid. §24.

Chapter II. On Demonstration.

§ 9. *Terms and Propositions.*—The Thesis consists of the subject and the predicate. Neither the one nor the other taken by itself is the point of disputation;[1] only when they are combined together in the form of a proposition have we a matter for discussion. If the statement is made, "Sound is eternal," it is understood by the disputants that there is such a thing as sound and that some things are eternal. The author of the "Great Commentary"[2] refers to the terms as the "Thesis-parts," and the combination in the proposition, the "entire Thesis."

The distinctions of Aristotelian logic between negative and affirmative, universal and particular propositions, are also to be found in Hindu logic.[3]

§ 10. *Subject and Predicate.*—The subject of the Thesis is called "object:" it is the object of which something is asserted. The predicate is called the "significance:"[4] it is a meaning which is given to the object by the proposition whose predicate it is.

Subject and predicate stand in a three-fold relation to each other. (1) When the subject is uttered by itself it merely calls our attention to a certain object, but if the predicate be uttered it effects a double change, (*a*) it particularizes the meaning of the subject, and (*b*) it includes the subject under a larger genus.[5] For example, in the judgment, "diamonds are combustible," the predicate out of all the attributes possessed by diamonds particularizes their combustibility, and also places diamonds in the class of combustible things.

[1] P. Ç., 5–6; G. C., 1:25 *seq.*
[2] G. C., 2: 6; 3:1.
[3] G. C., 3:10.
[4] G. C., 1: 26 *seq.*
[5] G. C., 1:27; Z. G., 2:19 *seq.*

(2) The predicate is called "mode," because by its utterance a particular way of thinking of the subject is determined, but on the other hand the subject must have the attributes connoted by the predicate,[1] that is, the subject must have the "mode" contained in itself. Hence the subject is called "mode possessor." In other words, the proposition is looked upon as a process of analyzing the subject, separating a certain attribute from the others possessed by the subject, and this attribute is to be the "mode" in which we are to think of the subject presented in a given proposition.[2] (3) Lastly, the subject is said to be "differentiated" and the predicate to "differentiate." For in the Thesis the predicate differentiates the subject from that from which it is heterogeneous.[3] When diamonds are said to be combustible, they are separated from the class of non-combustible matter.

Neither Dinna nor Çaṃkara offers a clear analysis of the import of the proposition, or develops a definite theory of the judgment, but these views of subject and predicate give us some data from which we may construct their theory. A more complete analysis of their meaning is offered in a later portion of the present monograph.[4]

§ 11. *The Thesis.*—As already stated, the Thesis furnishes the theme for disputation. Propositions may be divided into four classes[5] with respect to their fitness to serve as Theses: (1) *Universally accepted truths.*—A truth that is self-evident or that is universally accepted by human opinion has no value as a Thesis, for it requires no proof. (2) *Dogma.*—The theory or teaching of a certain school is one kind of universally accepted truth within that school. (3) *Implied truth.*—When a Thesis is admitted, it is a mistake to think that another truth

[1] G. C., 1:27; Z. G., 2: 21.

[2] This treats all propositions as expressions of analytical judgments,—judgments that analyze what is given in a perception.

[3] G. C., 1:21; Z. G., 2:21–22.

[4] Vid. Note IV.

[5] G. C., 1:24 *seq.*

implied in it needs no further proof. The Thesis is not perfect so long as all that is implied in it is not expressed. (4) *Individual opinion.*—Only an opinion which could excite the disagreement of an opponent could serve as the basis for dispute. If an assertion is of a kind to which no objection is made no proof of it is needed. An assertion which may be questioned is always "made of one's choice."

Thus a Thesis is any truth not accepted by the opponent but thrown open to doubt. It is not, as one might think,[1] a new truth. It may be well known to him who makes the assertion and tries to demonstrate it, only his opponent has not yet accepted it. As Çaṃkara says,[2] "By reasoning, the truth not yet understood by the inquirer is opened and pointed out." The method by which this is done is to show how the truth of the Thesis can be derived from already accepted truth. The relation of Thesis and Reason is, of course, the central problem of Hindu logic as it is of all logic.

§ 12. *The Reason.*—When for the assertion "Socrates is mortal," the reason be given "because he is a man," the latter proposition is called the Reason for the former, which is called the Thesis.

It is supposed in every Reason that the validity of the Thesis depends on and can be proved by the truth of this statement. Hence, first of all, a Reason valid for the proof of a Thesis must be a truth accepted by all.[3] If not, the Thesis will be a house built upon the sand. Furthermore, since the Reason is presented in order to prove the given Thesis, it must be a statement about all of that of which something is asserted in the Thesis. For if there be any part of the subject of the Thesis left untouched by the Reason, then that part of the subject of the Thesis can never be proved.

Therefore, in general, the connotation and denotation of the

[1] Cf. Murakami in his Immyo, p. 219.

[2] P. Ç., 5.

[3] D. Ç., 3–4.

subject of the Thesis must not be diminished in the Reason.[1] To prove a Thesis "mS is P," the Reason must be of the form "mS is H."[2] A subject whose denotation could be expressed by the form "(m+x)S" would not invalidate the Reason, although x would be of no service in the proof; but if its denotation were expressed by "(m—x)S," it would never prove that the predicate belonged to another class, "mS." Thus in Hindu logic the form of the Reason is fixed; it takes the subject of the Thesis for its own, the distribution remaining undiminished.

The new element introduced into the Reason is the Middle Term, or as the Hindu logicians called it, Hetu. The whole value and weight of the Reason depends upon this element, and it is upon the problem of the Middle Term that Dinna continually dwells.

§ 13. *The Example.*—There is no more inappropriate name in Hindu logic than "Example," applied as it is to the major premise. To understand the use of such a term we must remember that previous to Dinna's time the major premise was replaced by an enumeration of homogeneous and heterogeneous examples from which one was to draw the analogy. It was due to Dinna's own influence that these particular instances took the form of universal proposition serving as a major premise. He retained for this proposition, however, the old name of "example." It would have been better had Dinna changed the name for that part of his syllogism, but since he did not, nor any of his successors, we shall retain the traditional term throughout the present monograph, designating the major premise as "Example" with the capital E, an analogical example as "example" with the small e. Example in this latter sense is still retained by Dinna, but only as an aux-

[1] D. Ç., 6.

[2] Throughout this essay, S stands for the subject of the Thesis (minor term), P for the predicate (major term), and H for the predicate of the Reason (middle term). And here *m* means any quantification of the term, m+x a greater, and m—x a less extension than m.

iliary to the understanding of the thing demonstrated, not as an essential element of reasoning.

As has already been pointed out, the Hindu logicians regard all things as divided into two classes with respect to any attribute A, namely those which are homogeneous with and those which are heterogeneous from A. Dinna makes use of both Homogeneous and Heterogeneous Examples to assist the understanding of the hearer.[1] Thus—

> All diamonds are combustible,
> For all diamonds are carbon,
> And all carbon is combustible, as graphite,
> but no non-combustible matter is carbon, as gold.

1. *Homogeneous Example.*—Before Dinna's introduction of the major premise, it was deemed necessary that the examples given in the reasoning should by their connotation be homogeneous with the predicate of the Thesis, and also with Hetu. When it was said

> Diamonds are combustible,
> because they are carbon,
> like graphite, charcoal, etc.,

it was intended to point out that things of this kind were both carbon and combustible. They were, then, homogeneous with the predicate of the Thesis and with Hetu. Graphite in being carbon and at the same time combustible, was thought by the old logic of Muchak and Seish to furnish the connecting link between the property of being carbon and combustibility. But when Dinna's attention was once directed to this problem, he did not feel that the enumeration of other cases such as graphite, charcoal, etc., which, we find, are things that are both carbon and combustible, was adequate ground for the assertion that diamonds were also combustible, being carbon. He says, "The connotation of the major term (combustibility) must inevitably be in Hetu (carbon) in a proof of the Thesis,[2]

[1] P. Ç., 14. Cf. Examples in G. C., 3:1–17; P. Ç., 12–15; Z. G., 3:51–83; 4:1–9.

[2] D. Ç., 15.

and to show this inevitability we must assert that all that which is Hetu (carbon) has the connotation of the major term (combustibility). So long as we cannot assert this we have not furnished a complete proof for the Thesis (diamonds are combustible)."[1] Thus he thought it necessary to introduce a universal proposition to take the place of the analogical examples, and he gave us a new syllogistic form:

> "Diamonds are combustible,
> Because they are carbon,
> And all carbon is combustible."[2]

His rule for the formation of the new Example is, "Take the middle term for the subject and the major term for the predicate."[3] If the Thesis and Reason are respectively

All S is P
All S is H,

then according to this rule the Example for the syllogism should be

All H is P,

never "All P is H," and if the Example cannot be made to conform to this formula, the reasoning is not sound.

2. *Heterogeneous Example.*—Although the Homogeneous Example is all that is necessary in the proof of a Thesis to show the inevitable relation between Hetu and the major term, yet it would be still safer reasoning,[4] thought Dinna, were we sure that no likeness whatever exists between Hetu and the heterogeneous major (H and non-P).[5] Hence he introduced as auxiliary to the major premise, the Heterogeneous Example. For instance, in our previous illustration the Heterogeneous Example would be "No non-combustible matter is carbon,"—in symbolic form, "No non-P is H." The form

[1] D. Ç., 13; G. C., 3:9.

[2] His illustration in D. Ç., 12, is about the non-eternity of sound, and the Example is "All products are non-eternal."

[3] D. Ç., 13; G. C., 3:9.

[4] D. Ç., 12.

[5] D. Ç., 16.

that Dinna prescribes for the Heterogeneous Example directs the reasoner to take "the heterogeneous major term for the subject and Hetu for the predicate of the universal negative proposition."[1]

3. *Analogical Examples.*—To these universal propositions forming respectively the homogeneous and heterogeneous Examples, Dinna adds, as a relic of past theories, a series of analogical examples whose purpose is purely didactic,—to furnish a hint, as it were, of the inductive process by which the universal proposition serving as an Example was obtained. So then, so far as deduction is concerned, the propositions necessary to the proof are only three. The Heterogeneous Example and both kinds of analogical examples have some interest for the art of debate, but none for the science of reasoning.[2]

§ 14. *The Syllogism.*—We have now examined the syllogism of Dinna and Çaṃkara in its parts. It is necessary that we should look at it as a whole for our better understanding of what is to follow. And first of all, let us review the rules of syllogistic reasoning and put them in as compact form as possible.

Rules of the Syllogism.—I. A syllogism has only three necessary elements: Thesis, Reason and Example.

II. The distribution of the subject of the Thesis should be kept unaltered in the Reason.

III. (*a*) A Homogeneous Example should take Hetu for its subject and the predicate of the Thesis (the major term) for its own predicate.

(*b*) A Heterogeneous Example should take the heterogeneous major for its subject and the negative Hetu for its predicate.

IV. The Examples should always be universal propositions; the Homogeneous a universal affirmation; the Heterogeneous a universal negation.

[1] D. Ç., 13; G. C., 3:9.
[2] D. Ç., 12, 14.

These rules need no further explanation. From them we obtain the following:

Corollaries.—I. There is only one form of the syllogism. This form is—

mS is P
mS is H
All H is P.

This follows from the requirements of all syllogistic rules.

II. Three terms and only three can be used in the syllogism. Two of them are included in the Thesis (by Rules II and III). The one other term that can be used is Hetu.

III. The Thesis is to be proved by the Reason and the Example. In these the distribution of the major and minor terms must be the same as in the Thesis (by Rules II and III).

IV. Hetu is always distributed at least once, namely, in the Homogeneous Example (by Rules III *a* and IV).

Thus, although the Hindu rules of syllogistic form are originally few in number, they embrace all the scholastic rules with the exception of the superfluous rules respecting particular and negative premises.[1]

The most interesting thing to be noticed in the Hindu syllogism is its symbolic form. We may turn to consider the

[1] To compare the rules of the syllogism in scholastic logic:

1. Every syllogism has three and only three terms,—compare Corollary II from Rules II and III.

2. Every syllogism contains three and only three propositions. See Rule I.

3. The middle term must be distributed at least once, and must not be ambiguous. Corollary IV, Rules III *a*, *b*, IV.

4. No terms must be distributed in the conclusion which were not distributed in one of the premises. Corollary III, Rules II, III *a*, *b*.

5. From negative premises nothing can be inferred. Rule II, cf. also § 15 (2).

6. If one premise be negative, the conclusion must be negative; and conversely, to prove a negative conclusion one of the premises must be negative. This is absent in Hindu logic.

7. From two particular premises, no conclusion can be drawn. Rule II; cf. also § 15 (2).

8. If one premise be particular the conclusion must be particular. This is absent in Hindu logic.

relation of this to the Aristotelian division into figures and the scholastic division into moods.

2. *Figures and Moods.*—Corollary I tells us that the fixed form of the syllogism is :

mS is P
mS is H
All H is P.

And I am not aware that Dinna or any other Hindu logician studied the different positions in which the middle might occur. They seem to have regarded the form Barbara as typical of all syllogistic reasoning. And yet it may be that this disregard of the other moods of the syllogism was not altogether an oversight. The scholastic doctrine of moods and figures depends upon the classification of judgments as affirmative and negative, universal and particular. Although, as we have said, these differences of type were recognized by the Hindu logicians,[1] it may be that they regarded them as unessential. For example, their distinction between the heterogeneous and the homogeneous made it particularly natural for them to treat a universal negative proposition as though it were affirmative,—a practice common enough in post-Aristotelian logic. Thus they would have to identify the negative judgment " No A is B " with the affirmative " All A is non-B." Again, it is possible to treat a particular judgment as universal, for, as some of our moderns have pointed out, a term undistributed with respect to one class, is distributed with respect to another possible class. " Some A's " are all the A's that are meant by the " some." That is, if " some A's " mean A_1, A_2, A_3, though not other A's, such as A_4, A_5, etc., then " Some A's " means *all* these A's and not any more or less. It is a question as to whether " some A's " should be treated as part of the genus A, or as the whole of the species " some A," and Hindu logic prefers the latter way of dealing

[1] In Section 9, I said that these distinctions are recognized in Hindu logic, for I find them in Kwei-ke's Commentary (G. C., 3:10). But Dinna in his D. Ç. does not seem to trouble himself with them.

with the subject. According to Dinna's formula, if we were to reason "some S is P because some S is H," the word "some" used in the reason must be acceptedly the same "some" as that which is used in the thesis. It is conceivable that Dinna and Çaṃkara may have gone through some such reasoning as this, although in their extant works no such discussion appears, and on the whole it is more probable that they did regard the matter in this way than that, with all their subtlety, they should have failed to detect the possibility of different moods of the syllogism. For, of course, the division of the syllogism into moods, although resting on the distinction between figures (a question of the position of Hetu), was only capable of elaboration in case the four proposition-forms, A, E, I, O were recognized. The moods of the post-Aristotelian logic yield no other example than Barbara of the mood A A A.

The temptation to classify syllogisms in terms of figure and mood—for by many of the moderns this is regarded as a mere temptation—is less potent in the Indian than in the Aristotelian logic for the further reason that the former was a logic of proof, not a logic of deduction. The universal affirmative proposition having once been recognized as typical, and the Theses being always presented in that form, it follows that no other form could be advanced for the reasoning. Thus, in the Hindu logic only one figure and one mood of the syllogism is possible. The Hindus, it would seem, were thus fortunately saved from the "*falsche Spitzfindigkeit der vier syllogistischen Figuren.*"

§ 15. *The Three Phases of Hetu.*—The doctrine of the phases of Hetu is a discussion of the relations of exclusion and inclusion that can exist between the middle, the major, the minor, and the heterogeneous major term. Dinna enumerates three characteristic relations of this kind.

1. *First Phase.*—It is stated in the reason that S is H, hence there must be some kind of relation existing between

the H and the S, and whatever the import of the proposition "S is H" may be, this much is certain,—that H is said about the whole of S, not of a part of it merely. The Reason was given to establish the Thesis, and if H is said about the part only of S, then the Reason is only valid for that part of S, and consequently the applicability of the predicate to the whole of S cannot be proven by it. In the reasoning, "All diamonds are combustible because they are carbon," if being carbon is true only of some diamonds, then that "some" and not "all" are shown to possess the property of combustibility. Thus Hetu, in order to prove that S is P, must be about as many things as are included in S: hence Dinna declares that H is the predicate of the total S,[1] The failure to establish this relation between Hetu and the subject of the Thesis, results in the fallacy of the illicit minor.

2. *Second Phase.*—Since there is a relation between S and H, it follows that if there be any relation between H and P, it is possible that the relation between S and P could be found. This relation between H and P is furnished by the Homogeneous Example, which states "H is P." If A = B and B = C, then *a priori* A = C. So the relation of H with P is another important step in the proof of the Thesis, and this phase of Hetu was Dinna's second object of study.

Whatever the import of the proposition may be, it is evident that H which carries P in or with it is connected with P by the Example, and unless this connection of H with P is invariable, the fact that S is P can never be proved. If combustibility does not necessarily follow from the property of being carbon, diamonds, although they are carbon, may not be combustible. Combustibility may be an attribute of things other than carbon, but must at least apply to carbon. Hence Dinna declares that H must necessarily be included in the

[1] D. Ç., 3, 5, 6, 8; P. Ç., 8; G. C., 2:6 *seq.* The word "mode" is used for "predicate." (Cf. Section 9.)

class of things homogeneous with P.[1] We have noticed in the treatment of the so-called "Nine Reasons" of Socmock, that two correct Reasons were mentioned (the second, "all homogeneous and no heterogeneous," and the eighth, "some homogeneous and no heterogeneous").[2] That is to say, H sometimes includes all of the P-homogeneous element, and sometimes only part of it, but never any P-heterogeneous element. So Dinna was careful not to say that all, or the total P is inseparable from H, only that H should be always some P.

3. *Third Phase.*—The third phase is concerned with the relation that must exist between Hetu and the Heterogeneous Example, between H, then, and non-P. The non-P, says Dinna, must be totally absent from H. Suppose, for example, that some carbon is not combustible; the proof will then be impossible, for diamonds may be that part of carbon which is not combustible. If H be non-P as well as P, the question as to the class to which any individual case of H may belong is not uniquely determined.

To summarize the doctrine of the three phases of Hetu we find:

1. Hetu appears in the Reason as a predicate including the total subject of the Thesis.

2. The principle of inference in the Reason depends upon the inseparability of Hetu from that which is included in the predicate of the Thesis. Here we find Dinna's doctrine of inference. With this principle he replaced the analogical examples with the new Example,—with this principle he introduced a new logic.

3. Hetu has nothing whatever in common with the P-heterogeneous world. The moment it takes a step into it, proof has become invalid.

[1] D. Ç., 12, 14; P. Ç., 9; G. C., 2:10 *seq.*
[2] Vid. § 3.

In Hindu logic reasoning is said to be fallacious in four ways with respect to the first phase of Hetu, in six ways with respect to either the second or the third, and in four ways with respect to both the second or the third phase, making fourteen altogether. The Fourteen Fallacies will receive a detailed discussion in Chapter IV.

Chapter III. On Refutation.

§ 16. *Proof and Disproof.*—All arguments, from the wrangling of children to the disputation of philosophers, have for their end either the proof or the disproof of a Thesis. The nature of arguments advanced in proof has been considered in the preceding chapters. We turn now to the analysis of arguments urged in disproof of a Thesis. There is, to be sure, no difference between the two for a logic of inference. It is a practical logic which insists upon such a distinction. And even Hindu logic, practical as it is, takes little notice of the theory of disproof after the time of Dinna and Çaṃkara. It was a respect for tradition that made these reformers accord an independent treatment to the reasoning of disproof. Respecting propositions, syllogistic constructions, and inference, nothing new could be developed from the study of the doctrine of refutation.

A proof is the establishment of a Thesis, and disproof is the destruction thereof. Hence arguments urged in proof and in disproof cannot both be correct. Disproof is possible only when a fallacy is inherent in the proof. So it is said, "The domain of refutation is co-extensive with the fallacies of demonstration."[1] If a Thesis be proved by a perfect reasoning, it is impossible to disprove it. Sophism and eloquence may assist in carrying the impression of disproof to the vulgar, but to do this is not the aim of Hindu logic which, however practical, is not sophistical.

§ 17. *Refutation.*—When an argument is urged in disproof it is called an argument in refutation. In refutation, then, it is necessary to discover some defect in the opposing demonstration. And when any fallacy is found in the proof, then there are two ways of undertaking refutation.[2]

[1] G. C., 1:19; Z. G., 2:3.
[2] D. Ç., 19; P. Ç., 36.

1. *The Syllogistic Method.*—This method of refutation is to present a syllogism which can prove a proposition contradictory to a given Thesis.[1] Thus when it is argued,

> "Dry bread is better than wisdom,
> Because it is better than nothing,
> And nothing is better than wisdom."

it may be refuted by another syllogism,

> "Dry bread is not better than wisdom,
> Because it is a material thing,
> And no material thing is better than wisdom."

in which the opponent, having seen the double sense of the word "nothing," used as Hetu in the demonstration, has avoided the use of such ambiguous word and has shown how the true reasoning ought to be presented.

2. *The Detective Method.*—When one cannot construct a syllogism supporting the contradictory Thesis, it is sufficient to point out the defect in the demonstration, to an unaccepted Reason or Example, or to some fallacy in the way in which the statements serving as Reason or Example are employed.[2] That is to say, it is sufficient to point out any error or fallacy in the argument of proof in order to effect a refutation. This method, however, does not necessarily disprove the truth of the Thesis, it only leaves it unsupported.

By either of these two methods the opponent can be brought to a conviction of the unsoundness of his position.

[1] D. Ç., 8–13.
[2] D. Ç., 8–13, 19–20.

Chapter IV. On Fallacies.

§ 18. *General Doctrine and Classification.*—Any defect in reasoning, whether in a proof or in a disproof, makes it fail to attain its end. Such failure must result if a disputant arrive at a conclusion contradicting a plain fact, or if his reasoning be based upon an arbitrary assumption, or if the reasoning be of an illogical nature. In all such cases as these he fails to demonstrate or to refute the Thesis, and hence can never convince his opponent.[1] Such reasoning is defective, and the defect is called a fallacy.

Defective reasonings, says Kwei-ke,[2] are of two kinds: (1) those which contain defective language, and consequently fail to convince the opponent; (2) those which are logically imperfect, and thus fail to prove or disprove the Thesis. But of whatever kind the defect may be, it must be contained in one or more of the propositions. Çaṃkara thought it convenient to divide fallacies into (1) the fallacies of the Thesis (nine); (2) of the Reason (fourteen); and (3) of the Example (ten).[3] In all, then, there are thirty-three recognized fallacies, but if we consider the combinations of the fallacies of which a syllogism may be guilty, the number is greatly increased. Of this kind the Thesis is said to possess 9,216,[4] the Reason 117,[5] the Example 84,[6] in all then 9,417 fallacies. Fortunately it is unnecessary to treat all the "Ten Thousand Fallacies" in order to understand Hindu logic, and we may confine ourselves to the thirty-three chief kinds.

§ 19. *Fallacies of the Thesis.*—That a fallacy can be involved in the mere presentation of the Thesis, is not, of course,

[1] D. Ç., 15; G. C., 3:18; Z. G. 4:10.
[2] G. C., 2:21.
[3] D. Ç., 15–33.
[4] G. C., 4:5 *seq.*
[5] G. C., 5:19 *seq.*
[6] G. C., 6:5–6, 9.

admitted in Aristotelian logic. The Hindu logicians, however, understood by fallacy any fault which is connected with argumentation. Having detected types of proposition which could not offer proper subject-matter for proof, they naturally regarded it as possible for the mere statement of a Thesis to be fallacious.[1] Thus in his Dvāra-tāraka-çāstra Dinna gives five examples of fallacious Theses.[2] These are also treated by Çaṃkara in his Praveça-tāraka-çāstra.[3]

1. *Thesis contradictory to intuitional facts.*—A Thesis is a proposition advanced for proof, but if it be in flat contradiction to a fact it cannot be proved, for proof, after all, is to be based upon facts, which cannot be contradictory in themselves. Thus to say that sound is inaudible is to commit the fallacy of presenting as a Thesis a statement contrary to fact.

2. *Thesis contradictory to secondary ideas.*—A secondary idea, as I shall later explain at greater length,[4] is an idea somewhat less immediate than a bare intuition, *i. e.*, an idea connected with an intuition by thoroughly habitual associations. If I see the sun going down in the west, I glean from the perception that evening is coming. The idea of the approaching evening is a secondary idea, being derived by some mental activity from a newly received intuition of the setting sun. If at such a time I make the statement, "It is a beautiful morning," the statement is as patent an absurdity as though I had said "The sun is not setting." It is thus unfit to serve as a thesis.

3. *Thesis contradictory to the public understanding.*—A proposition which fails to convey an intelligible meaning cannot

[1] Cf. Sidgwick's "unreal" propositions, which are insusceptible of proof, on the principle that "a judgment is a thesis only when capable of expression in intelligible language and while the need for proof is felt." Such are tautologous propositions, self-contradictory propositions and propositions which fail to convey intelligible meaning.—Fallacies, Part I, Ch. II, Section 1.

[2] D. Ç., 2 *seq.*

[3] P. Ç., 15 *seq.*

[4] Vid. 72 *seq.*

be a perfect Thesis. If the assertion is in opposition to the public belief, it often fails to convey its meaning to the public, and in so far as this is so, it is an imperfect Thesis. But Dinna adds that such a proposition can be made a perfect Thesis by prefixing some such phrase as "I maintain that." For example, "I maintain that women and money are abominable things."

4. *Thesis contradictory to one's own doctrine.*—Inconsistent assertions are also said to be fallacious, for they serve as their own refutation. Dinna gives as an example the judgment "Sound is eternal." This is only contradictory for the Vaiçeshika philosophers; it is for this school an insane, rather than a self-contradictory Thesis in the modern sense.

5. *Thesis contradictory in itself.*—A self-contradictory proposition, such as "No assertion is true" is suicidal. Such a proposition admits of no proof and needs no disproof.

The next four fallacies of the Thesis are not found in Dinna's work, but only in Çaṃkara's. This is one of the very few additions made by later philosophers to Dinna's system. It will be remembered that Dinna said, "The terms used in the Thesis must be accepted by all;" if not, there must be a question as to the meaning of the terms before one can proceed to prove the Thesis. Upon this principle of Dinna's teaching,[1] Çaṃkara developed the following:[2]

6. If a disputant wishes to prove that "God is almighty," and if his opponent questions the very existence of God, then the Thesis is not a fit subject for proof until at least God's existence is admitted by the opponent. Such a Thesis is called a Thesis with an *unaccepted subject.*

7. If the predicate of the Thesis is in question, the Thesis is said to be one with an *unaccepted predicate.*

8. And if both subject and predicate are questioned, then the Thesis is one with *both parts unaccepted.*

[1] D. Ç., 1; G. C., 1:33.
[2] P. Ç., 17–11.

9. The last fallacy of the Thesis is of quite a different character from the preceding. If in the first fallacy it was regarded as absurd to maintain as a Thesis a statement directly contradictory to fact, so in the last fallacy it is maintained to be equally absurd and fallacious to offer as a Thesis a statement which everyone would accept as a plain statement of fact.[1] No less absurd than to propose the Thesis "Sound is inaudible" is it to propose the Thesis "Sound is audible." In proof, a *universally accepted truth* is treated as an imperfect Thesis.

Summary.—The nine fallacies of the Thesis are not fallacies in the Aristotelian sense. They do not point out reasons which ought not to be given to establish a statement, but statements which ought not to be reasoned about. If they are propositions which are not sound (1, 2, 4 and 5), or not intelligible as a whole (3), or in their parts (6, 7 and 8), or if they do not need any demonstration (9), they cannot be regarded as good Theses.

§ 20. *Fallacies of the Reason.*—Dinna enumerated fourteen fallacies of the Reason. These he classed into three groups with reference to the phases of Hetu. The first four are those which are defective in the first phase of Hetu, the next six are those which are defective in either the second or the third phase, and the last four are those which are defective in both the second and the third phases.

1. *The four "Unaccomplishables."*—If Hetu in the Reason does not apply to the individuals devoted by the subject of the Thesis, the Reason cannot perform its function of proving the Thesis: it is set an "unaccomplishable" task.

If it is denied by both disputants that Hetu is true of that of which something is said in the Thesis, then the Reason can neither prove nor disprove the Thesis. In the reasoning,—

[1] Cf. Hume, Treatise on Human Nature. B. I, P. III, § 16. "Next to the ridicule of denying an evident truth, is that of taking much pains to defend it."

Sound is non-eternal,
Because it is visible,

Hetu "is visible" is not true of sound. If this lack of truth is recognized (1) by both sides, the Reason is said to be *unacceptable for both*; (2) if by one side only, *unacceptable for one.* (3) Even when the truth of Hetu predicated of the subject of the Thesis is merely doubted but not altogether denied, the Reason cannot accomplish its function. In this case it is said to be *impotent through doubt.* (4) If the existence of that of which Hetu is predicated is questioned, the Reason cannot be given, on the same ground that the Thesis was regarded as fallacious when the existence of its subject was not admitted. This is called the *fallacy of impotence due to the subject.* In various ways, then, the four fallacious reasons are those in which Hetu is not admitted to be true of the subject.

2. *The six "Uncertainties."*—In these the fallacy consists in violating the canons of Hetu *either* in its second or in its third phase. In the second phase it is required that H shall be some P and in the third phase that it shall be no non-P Uncertainty arises when the Hetu is either

(1) All P and all non-P (Socmock's first relation), [1]
(2) No P and no non-P (Socmock's fifth relation),
(3) Some P and all non-P (Socmock's seventh relation),
(4) All P and some non-P (Socmock's third relation),
(5) Some P and some non-P (Socmock's ninth relation).

The fourth and sixth possible relations of Socmock are omitted from this classification. Evidently the relations, H = no P and all non-P, and H = no P and some non-P would not result in an "uncertainty" respecting the truth of the Thesis, but would amount to its disproof. They violate both the phases of Hetu and belong therefore to the next group of fallacies mentioned by Dinna.

[1] Vid. § 3.

Of the five "uncertainties" that have been enumerated, the first and the second are the only ones which require explanation. In the first, it is seen that H includes the whole of P and the whole of non-P and corresponds, therefore, to what in modern symbolic logic would be called the Universe of Discourse. An example of such a syllogism is the following:

Sound is eternal,
Because we can know it,

in which all that is knowable is supposed to include both the eternal and the non-eternal. The second "uncertainty," that in which H is neither P nor non-P, gives rise to some difficulty. If, as is usual in Hindu logic,[1] the Universe of Discourse is not distinguished from *the* Universe, it does not appear that any term could be given which would lie outside of both P and non-P. In this sense the only illustration of Hetu which could commit this fallacy would be a meaningless or a self-contradictory term. If, however, we consider the Universe of Discourse to be of narrower extent than the whole universe, such a fallacy could readily be illustrated. Thus, if we said

A stone is immortal,
Because it is inanimate,

we could well consider "inanimate" to lie outside of the disjunction mortal and immortal. But, of course, "immortal" is not equivalent to the "infinite" term non-P. It seems more probable, however, that this fallacy was mentioned by Dinna for the sake of completeness and symmetry.

(6) The sixth type of "uncertainty" is of no little interest in that it contains the first recognition of the possibility of antinomous reasoning and indicates the sense in which such reasoning was treated as fallacious. An "*uncertain opposi-*

[1] Cf. p. 23.

tion" arises when both a Thesis and its contradictory (antithesis) are supported by what seem to be valid reasons. As one example, Çaṃkara gives the following:

Vaiçeshika against Mīmāṃsā,

> "Sound is non-eternal,
> Because it is a product."

Mīmāṃsā against Vaiçeshika,

> "Sound is eternal,
> Because it can be heard always."

And Çaṃkara thought both arguments logically correct, yet to be classed as defective because they lead to contradictory conclusions.[1]

3 *The Four "Inconsistencies."*—In these fallacies Hetu is imperfect *both* in its second and third phases. We are no longer left in doubt as to the truth of the Thesis, but its contradictory is actually proved by the given Reason. These four "inconsistencies" are the following:

(1) Hetu inconsistent with Predicate: Thus in

> "Sound is eternal,
> Because it is a product,"

Hetu "a product" is *inconsistent with the Predicate* of the Thesis, "eternity." Therefore by reason of being a product the non-eternity, not the eternity of sound, would be proved. We have here the analogue of the remaining "relations" mentioned by Socmock, namely, "H = no P and some (not all) non-P."

(2) But frequently the baldness of this fallacy is hidden by the use of an ambiguous term in the predicate of the Thesis. Then, it is said, the Thesis must be understood in its implied meaning, and when its predicate is inconsistent with Hetu the Reason is pronounced *inconsistent with the implied Predicate.*

[1] P. Ç., 23.

(3) Dinna includes as a third case the one in which Hetu is *inconsistent with the expressed Subject.* Such an inconsistency, taken alone, is a breach of the rules governing Hetu in its first phase, and as such has already been classified among the "unaccomplishables." But now this inconsistency is apparently considered with respect to the effect it may have upon the relation between Hetu and Predicate, *i. e.*, as introducing errors in the second and third phases of Hetu.[1]

Çaṃkara gives as an example the following bit of reasoning of the Vaiçeshika school:

> "Generality is neither substance, quality, nor action,
> Because it depends upon one substance and possesses quality and action."

But, to give an example more intelligible to those who are not familiar with the Vaiçeshika philosophy, we might take the following:

> Substance is eternal
> Because it is a product.

In this case Hetu "a product" is inconsistent with the nature of the Subject "substance." At the same time the two propositions which if true would establish the Reason valid in the second and third phases of Hetu are both false. It is false, namely, that "All products are eternal," and that "There are no non-eternal products."

(4) The last "inconsistency" arises when Hetu is *inconsistent with the implied Subject.*

Summary.—We may sum up, then, the fallacies of the Reason as follows: The first three of the "unaccomplishables" represent the cases in which H is not admissible of S. The reasoning as advanced is

> "S is P,
> S is H."

[1] Such an effect is of course accidental, so that we have here, not a new fallacy, but a combination of some already noted.

If the Reason expressed the true relations between S and H we should have

> "S is P,
> non-S is H."

As a formal syllogism this would commit one of the fallacies of "negative premises" recognized by scholastic logic. The last "unaccomplishable" is one which is not recognized as a fallacy in Aristotelian logic, but the discussion as to how far a categorical judgment ought to imply the existence of its subject is one which has an important place in modern logical doctrine.[1]

Excepting the sixth or last of the "uncertainties" (which is only a fallacy of debate, for Çaṃkara himself admitted its logical correctness and did not mean it to be regarded as a formal fallacy), all the other "uncertainties" may be represented in the following scheme:

either H { includes P, includes non-P }   or H { excludes P, excludes non-P }

whereas it should be:

H { includes P (the second phase), excludes non-P (the third phase). }

The first, third, fourth and fifth of the "uncertainties" are of the former kind: the second is of the latter. The first type evidently commits the fallacy recognized in Scholastic logic as "undistributed middle:" the latter type has no exact analogue in Scholastic logic.

The last four, the "inconsistencies" are of two kinds. The relation of Hetu to the predicate in the first kind may be represented schematically:

H { excludes P (should include P, second phase), includes non-P (should exclude non-P, third phase). }

[1] Cf. Venn, Symbolic Logic; Bosanquet, Logic, etc.

If the facts were truly stated, the syllogism would be

S is P
S is H,
H is non-P,

and a fallacy of negative premise would be committed.

The last two "inconsistencies" must, as already explained, be distributed among the other types.

Thus we have found that some of the fourteen fallacies of the Reason are analogous to the Scholastic fallacies of negative premise and undistributed middle; some could not be classified among recognized types, while a few others are not true logical fallacies, but forms to be avoided in debate.

§ 21. *Fallacies of the Example.*—The fallacies of the Example are ten in number. The word "example" in its widest sense includes, as we have already seen, both homogeneous and heterogeneous Examples and the analogical examples discussed in Chapter II. The fallacies of the Example are violations of the Rules III *a*, *b* and IV there laid down to govern the use of the Example.

1. *Fallacies of the Homogeneous Example*—The first three are those of analogical examples and the other two are of the Example.

(1) An example which fails to support the homogeneous Example because the analogy is absent,

"Sound is eternal,
Because it is without form,
like atoms."

In this example "atoms" cannot serve as an analogue under the homogeneous Example because they do not share the characteristic trait of being "without form." This is called the *fallacy of excluded Hetu.*

(2) In the same way, if the analogical examples are not homogeneous with the predicate of the Thesis, they cannot serve to illustrate the Reason. Thus,

"Sound is eternal,
Because it is without form,
like a perception,"

in which "perception" is not "eternal" and cannot serve as an example. This is called the *fallacy of excluded Predicate.*

(3) When an analogical example commits both these fallacies it is called *excluded both.*

(4) In the foregoing section it was said that Dinna regarded the inference as invalid unless Hetu and the predicate of the Thesis could form the subject and the predicate respectively of a universal proposition. Such a proposition is the one completely satisfactory Example. and the lack of it is regarded as a fallacy—the *fallacy of absence of connection.*

(5) In the presentation of the Example, should the subject and predicate exchange places, a breach of Rule III *a* is committed, and the fallacy of undistributed middle is involved. Its formula would be

S is P.
S is H,
P is H.

To this Dinna gives the name of the *inverted affirmation of the Example.*

2 *Fallacies of the Heterogeneous Example.*—These fallacies are, *mutatis mutandis*, the same as the preceding five. They include then the case of (1) included predicate; (2) included Hetu; (3) both included; (4) absence of disconnection; (5) inverted negation of Heterogeneous Example.[1]

We have thus passed in brief review the thirty-three fallacies

[1] This last case is not merely the interchange of the subject and predicate of a universal negative proposition; such simple conversion could, of course, involve no fallacy. The error referred to may be illustrated schematically thus:

S is P
S is H
H is P
Non-H is non-P.

The last line should be:

Non-P is non-H.

of Hindu logic. I shall, I fancy, be excused from examining in this connection the "ten thousand" subdivisions of them.

§ 22. *Fallacies of Refutation.*—Before leaving the subject, however, one subsidiary class of fallacies should be considered. The thirty-three already enumerated and examined were treated by Dinna and Çaṃkara as fallacies of demonstration in contradistinction to certain other fallacies affecting refutation. This latter class requires brief notice. Of course, fallacies, as fallacies of inference, are of the same nature whether their object be to prove or to disprove the Thesis. In every reasoning Hetu must have its three phases perfect: Reason and Example must fulfill the conditions already analyzed. Unless these canons of reasoning are observed a fallacy is committed, whether to the end of proof or of disproof. But as we have had frequent occasion to notice, Hindu logic is not a pure logic, but a practical logic, and a practical distinction is to it a real distinction. Hence Dinna enumerates fourteen fallacies which may be committed in the course of the disproof of a valid Thesis,[1] and the relation between the fallacious refutation and the sound demonstration is expressed in the formula "The fallacious refutation signifies the truth of the demonstration."[2] These fourteen fallacies Dinna ascribes to Socmock.[3] They are those which we have already examined[4] and which consequently require no further analysis in this connection.

It is interesting to note that the fourteen fallacies of refutation are not mentioned in Çaṃkara's Praveça-tāraka-çāstra, nor in Kwei-ke's Great Commentary. From this we may infer that the tendency of Hindu logic was towards the purification of the science and the elimination of merely practical elements.

[1] D. Ç., 20 *seq.*

[2] G. C., 1: 19; Z. G. 2: 3. This, of course, could only be true in case the "syllogistic method" (p. 18) were employed to disprove the refutation. The "detective method" might confine itself to pointing out an "uncertainty," and contenting itself with thus demonstrating the lack of proof, need not establish the truth of the contradictory.

[3] D. Ç., 34.

[4] Chapter I, § 3.

Chapter V.—On the Data of Reasoning.

§ 23. *Intuition.*[1]—Dinna says,[2] "Demonstration and refutation are to communicate to others the reason for the Thesis and to convince them of its truth, but for self-understanding and the discovery of truth we are dependent upon intuition and secondary ideas." The intuitions and secondary ideas may thus be called the materials of our reasoning, and since neither demonstration nor refutation could be conducted save in terms of such materials, Dinna treats them in connection with these processes.[3]

The logical works of Dinna and Çaṃkara give us little insight into their epistemology. We must accept without discussion their distinction between a bare intuition, on the one hand, and a complete idea on the other. Any impression derived from the "outer or inner worlds" is, as merely received in consciousness, an intuition.[4] But if it be put into a class with other impressions already existing in consciousness, or if any step is taken by the subject which implies more than passive reception on his part, the impression is no longer classed as a bare intuition.[5] An intuition is treated as an individual fact. Should a universal be derived from several intuitions, this general notion is no longer an intuition.[6] All intuitions come through the senses,[7] external as well as internal,—color, sound, etc., as well as desire. But desire is an

[1] In strict translation, *Genryoh* may be rendered "real quality," *i. e.*, the impression just as it is received from the real object and before it has undergone any change due to subjective activity.

[2] D. Ç., 17.

[3] D. Ç., 19.

[4] D. Ç., 17 a; P. Ç., 33–34.

[5] D. Ç., 17.

[6] D. Ç., 17 b; P. Ç., 33.

[7] D. Ç., 17 b; P. Ç., 33.

intuition only in so far as it may be separated from the object desired and treated as a condition of mind: love, hatred, etc., are spoken of in the same way. Thus an intuition refers to a mere fact of consciousness. As such it is individual and contains no universal elements, and finally, it always comes through the senses, either internal or external, and is passively received.

§ 24. *Secondary Idea.*[1]—Any idea which shows an elaboration of the passively received intuition, Dinna calls a secondary idea. Thus an abstract idea resulting from comparison is a secondary idea.[2] So also, if an intuition is analyzed into parts, as the sum of these observed parts it is no longer a mere intuition but has become a secondary idea.[3] Or a judgment formed by the comparison of two ideas,[4] or a third judgment obtained by the comparison of two judgments,[5] all such contents as involve mental activity are included in the class of secondary ideas. A secondary idea is, then, any idea, observation or comparison which contains more than a passively received impression.

It will be seen that in this account no effort is made to discuss the psychological and epistemological problems that might naturally be expected to arise at this point. All that Dinna and Çaṃkara care to do is to show in what ways one's own understanding must precede argumentation. It is as representing stages in the attainment of this understanding that the terms *intuition* and *secondary idea* are introduced. Demonstration and refutation are instruments for the communication of understanding to others. It is to be noticed that Dinna

[1] A more literal translation of *Hiryoh* is "compared quality," *i. e.*, any intuition which has received some modification through subjective activity (as comparison, etc.) This I rendered as "secondary idea," to avoid any confusion with "idea" in its widest (*e. g.* Lockian) sense.

[2] D. Ç., 18.

[3] D. Ç., 19.

[4] D. Ç., 18.

[5] D. Ç., 19.

does not assert that intuition is directly a material for reason, but only that the secondary idea is,[1] so that an intuition in order to become a basis of reasoning must be worked over by a subjective activity and become a secondary idea.

§ 25. *False Data*—When Dinna speaks of impressions being received by an intelligent mind, he of course refers to the healthy mind, or "right mind," as Çaṃkara puts it.[2] Kwei-ke adds the comment that the soundness of the sense organs must be included among the normal conditions. It is not to me evident that Dinna had any intention to exclude abnormal sense organs when he spoke of the intelligent mind, although it is possible that he might take for granted "an intelligent mind, of course, with normal bodily conditions." However, that may be, Kwei-ke's comment would lead us to the conception of false intuitions,[3] although the criterion of the true intuition is not discussed. A false intuition, though it may be properly elaborated, leads to a wrong secondary idea,[4] and a true intuition if it receive the wrong kind of elaboration will result again in a wrong secondary idea.[5] Still worse, if false intuitions receive wrong elaboration. In any case we have *false secondary ideas*, which when used in reasoning must fail to support the Thesis.[6]

As materials of reasoning Dinna and Çaṃkara mention only intuitions and secondary ideas[7] and ignore dogma, which it will be remembered the earlier masters had included. This is a step in the direction of the universality of the science, for the dogma of a certain school of religion or philosophy holds good only within that school.

§ 26. *Concluding Remark*—Thus we have briefly reviewed

[1] G. C., 6: 15.
[2] D. Ç., 18.
[3] P. Ç., 35.
[4] P. Ç., 35.
[5] P. Ç., 35.
[6] P. Ç., 36.
[7] D. Ç., 17; P. Ç., 33.

the most highly developed Hindu logic that is preserved in China and Japan, derived from the works of Mahādiṅnāga and Çaṃkara. We saw in the introduction that logic in the Nyāya philosophy is styled "the gate to truth," and consequently opens the only way to the highest bliss. So Dinna concludes his Dvāra-tāraka-çāstra with the words,

> "As an antidote to intellectual poison,
> this Gate of the supreme Nyāya is opened.
> Let all outside wanderers come from the
> false doctrines to the Truth."

PART III.—CRITICAL NOTES.

NOTE I. HETUVIDYĀ AS LOGIC.

Hetuvidyā[1] is the science, not the art, of reasoning: at least, as treated by Dinna and Çaṃkara it deserves this name. The earlier presentations were doubtless concerned rather with the art of debate than with the science of reasoning, but in the New System this is no longer the case. The proposition in the form of a Thesis is defined, the function of the middle term is studied, and the nature of subject and predicate explained. Types of inference are investigated, while questions concerned with the art of debate are dismissed.

We have, then, to deal with the science of reasoning, and by reasoning I mean any operation of the human thought by virtue of which it passes on to a new assertion by means of an old. It must not be supposed that Hetuvidyā is concerned with the psychology of reasoning, for it never pretended to study reason as an expression of human nature. It was not concerned with the process of thinking as involving a series of mental contents, but with thought in so far as it was intended to stand for a reality—that is, with the truth and error of thought. The nature of truth and error is no more a problem for psychology than is the nature of the good and the bad, the beautiful and the ugly. And since Hetuvidyā proposes to set forth the criteria of *true* reasoning, not a description of *any* reasoning, I call it a logic and not a psychology. To be sure, Dinna has treated intuition and secondary ideas, but in so doing he was concerned only with furnishing a philosophical groundwork for his theory of inference, just as Mill does in his "System of Logic," when he says: "Truth is known to us in two ways: intuition and inference."[2]

[1] § 1, Introduction:—Hetuvidyā-Immyo—the name of one of the five departments of learning in ancient India.

[2] System of Logic, Introduction, § 4.

Nor is Hetuvidyā a rhetoric of disputation. In the work of Miroc, greater attention was paid to the art of debate than to the science of reasoning, but in the New System of Dinna we have seen that the use of sophisms and eloquent special pleadings was not sanctioned. The subject-matter of the science was no longer mere beauty of language, but sound use of reason. It was to prove and to disprove that disputants were supposed to struggle, not to carry conviction or to shatter belief. Dinna's system was, to be sure, still practical in its outcome, and especially so in its treatment of fallacy, yet it was not more so than the Topics or the Sophistic Refutations of Aristotle. However practical it may have been, so long as the subject-matter of Hetuvidyā was reasoning itself, and not the language used in reasoning or the arts necessary to carry conviction, it was a logic, not a rhetoric nor an art of debate.

Finally, Hetuvidyā is a realistic or material logic, for it asserts the objective validity of correct reasoning. That is, turning to experience for the verification of an asserted premise, Hetuvidyā holds that if the two premises be verified in this way, then the conclusion of our reasoning will square with experience no less. But it does not try to explain *why* this should be so by classing inference among the "forms" of human thought and supposing these to exercise a "constitutive" influence on experience. Hetuvidyā does not seek to determine the forms of thought in the sense in which the transcendental logic of Kant does so, nor even in the sense in which the formal logic of such partial Kantians as Hamilton, Mansel and Thomson pretends to do so. Dinna and Çamkara do not appear to have been interested in the epistemological question as to why a syllogism will conduct us to objective truth. That it will do so they bluntly assert, but the problems which have led others to develop a doctrine of the "forms of thought" do not appear to have occurred to them. If the word "formal" be applied to a study of reasoning merely to point out that the

question as to the truth of the premises is ignored, then, indeed, Hetuvidyā is a formal logic. It teaches the correct form of inferential reasoning, but it does not say that this is a form of human thought; it does not say that this is the only way in which man *can* think, but that it is the way in which he *ought* to think. And this "ought" seems to have reference to something in the world of facts. For this reason I have called it a realistic or material logic, rather than a formal logic.

Hetuvidyā, then, maintains the objective validity of reason; but shall we take the "object" of such thought to be the world of empirical science, or the "ultimate reality" which various systems of metaphysics have distinguished from this? Our sources give us no answer to this question, but it appears to me that such a distinction between the world of phenomena and the world of noumena does not concern the science of logic. Whether our world be real, or only the symbolic representation of the real world, it is still only one world for man's understanding. It is the world with which mathematics, physics, chemistry, astronomy, psychology, ethics, logic—any science except a certain kind of metaphysics—deal. Logic need only lay claim to the same region of validity that other sciences possess: what this region is, may be left to metaphysics to determine. However, I am inclined to think that the Hindu logicians never thought of a world lying beyond the senses.[1] They speak of the world of sense as objectively real, and when Dinna maintains the objective validity of reasoning, he means its validity in this sense-world.

Mr. Herbert Spencer makes a distinction between Logic and the Theory of Reasoning.[2] "The distinction is in brief this, that logic formulates the most general laws of correlation among existences considered as objective; while an account of the

[1] The general tone of their writings, cf. D. Ç., 17, P. Ç., 33. The Stoic "*καταληπτική φαντασία*" is the criterion of truth for these logicians. Cf. § 25.

[2] Principles of Psychology. Sec. 302, vol. 2, p. 87 *seq.*

process of reasoning formulates the most general laws of correlation among the ideas corresponding to these existences." One is "a division of the science of objective existence," and the other is "a division of subjective science." But if ideas correspond to objective existence, as Mr. Spencer himself says, then we have no use for this distinction in logic, for reference may be made to one as well as to the other. Not only is the distinction quite unnecessary for our purpose, but I am afraid that the objective existences are beyond our reach, except by way of those ideas which are their representatives to us, and that the construction of such an absolute logic is impossible to man. But this is hardly the place for a critique of Mr. Spencer's doctrines. Suffice it to say that Hindu logic claims for reasoning an objective validity, and that this objective validity has reference only to the world of sensuous experience. In Mill's terminology, Hetuvidyā is a logic of truth, not a logic of mere consistency.

Note II. Proof and Deduction.

In the exposition of Dinna's logic the words "demonstration" and "proof" were used,—demonstration meaning the reasoning through which proof was offered. Now the word "proof" is often used very loosely, sometimes as synonymous with "reasoning," sometimes with "inference," again with "deduction;" but such a loose use of these words causes no little confusion in the treatment of logic. In this essay it is hoped that "inference" may be understood to stand for the relation between two ideas, in so far as this relation has its ground in another, or in other relations. It thus includes *deduction* (the inference of a possible truth from given truths), and *proof* (the search for accepted truths from which a given statement may be inferred), and *reasoning* as meaning much more,—as denoting, namely, all ratiocinative acts that can be expressed in language. Of this difference between deduction and proof a further explanation may be necessary, for in the course of the present essay Hetuvidyā is constantly referred to as a logic of proof, not as a logic of deduction.

Proof is sometimes understood to be the deduction of a material truth of a judgment from the material truth of other judgments, and thus proof and deduction are treated as one and the same thing, the former perhaps having more of practical implication, the latter remaining more purely formal.[1] But this is not what we really mean by proof and by deduction, nor can I agree with Professor Sidgwick that proof is a reasoning "in the face of hostile criticism to establish a truth by means of a test." Nor yet do deduction and proof appear to me to be the same road traveled in opposite directions; that is, in deduction we start from the premise, and in proof we start from the conclusion. The statement is true enough, but rather superficial.

[1] Cf. Ueberweg: Logik, § 135, English translation, p. 521.

To be sure, the conclusion of the deduction corresponds to the hypothesis of a proof, and the premises to the reasons. The relation between them does then resemble that which exists between "the road from London to York and the road from York to London." But the logical problems involved in these two processes are entirely different, however closely they may be allied from the point of view of psychology. The relations of one concept with others make inference possible, but from the point of view of logic, the problem of proof is to determine what truth or truths *indicate* the truth of the given assertion, whereas the problem of deduction is to determine what truth *can be derived from* the truth or truths premised. The business of proof is to find the middle concept which can establish the relation between the two concepts involved in the hypothesis, and the business of deduction is to make explicit the relation already existing between the two concepts which are both somehow related to a third. Finally, in deduction, all the materials or data of reasoning are given, and our aim is to obtain from them a necessary conclusion, whereas in proof only an hypothesis is given, and we are to get some truth already known which will furnish us with a ground for accepting the hypothesis. If we were required to investigate what would happen to an apple in the hand if the support were removed, under the condition that masses attract each other inversely as the square of their distance, *i. e.*, if we are to develop the given propositions into their necessary consequences, we are asked to perform a deduction. But if we say, the apple will fall down to the ground with such and such acceleration, and if we are asked to give a reason for this result, it is proof that is required. Thus the mental disposition in the business of inference may be the same in both proof and deduction, but the logical problem, the aim and the procedure are different in the two cases.

Again, hostile criticism may be in place when the proof is completed. Indeed, as Çaṃkara said, "if the truth of a

proposition be accepted on all hands, and there is no room in it for a doubt, then the proposition cannot be a thesis to be proved." But, of course, it is a mere sophism to regard the absence of the proof in this case as the presence of fallacy. The truth of such a proposition can be proved only too well, as Çaṃkara taught, by a logical process, and in a pure logic the presence of the hostile criticism is not a characteristic of proof. We mean by "proof," reasoning which establishes the truth, formal or material, of an assertion by means of other truths already accepted, and by "deduction," reasoning which derives a new and unknown truth from old data. In this sense we call Hetuvidyā a logic of proof.

Proof and deduction are both, however, types of inference: the conclusion is a necessary consequence of the premises, which makes the syllogism a type of inference, namely, deductive inference. So, also, when it is reasoned "A is C because A is B and B is C," the judgment "A is C" is logically supposed to be the necessary consequence of the other judgments "A is B" and "B is C." This thinking of the necessary consequences is an inference, namely, proof. Inference, then, is the genus, proof and deduction, the species.

Note III. Laws of Thought.

Since Dinna's and Çaṃkara's logic is admittedly a logic of inference, the question arises as to the principle upon which they regard this inference as resting. I know of no distinct formulæ corresponding to the Aristotelian laws of thought, yet the whole treatment of the science is a tacit recognition of these laws.

In the first place, Hindu logic is based upon a dichotomous system of classification. It treats the classes A and non-A as mutually exclusive. And, further, when Dinna introduces the Heterogeneous Example "non-P is not H" in the ratiocinative formula as a corollary of the Homogeneous Example, "H is P," and declares, as the third phase of Hetu, that there exists no relation whatever between H and non-P, he evidently means that H cannot be non-P as long as H is P, for there is no such thing as the Heterogeneous Example in the Hindu syllogism so long as there is no Homogeneous Example. In other words, "H is P" and "H is non-P" cannot both be true together,—*principium contradictionis* of the Scholastic logic.

Secondly, as to the relation between demonstration and refutation it is said in Hindu logic that "the domain of refutation is coextensive with the fallacies in demonstration,"[1] and "the fallacious refutation signifies the truth of the demonstration."[2] But since demonstration is to affirm and refutation is to deny the truth of a thesis, this relation between demonstration and refutation is in fact a theory of the relation between affirmation and negation, and involves the assumption that the truth of the one necessarily follows from the falsehood of the other.[3] The two contradictory judgments cannot both be false, nor can they admit the truth of a middle judgment, nor can

[1] P. 57.
[2] P. 70.
[3] P. 70. Note 2.

they both be true. A is either B or not B,—the *principium exclusi tertii.* The above quoted passages are from the great Chinese commentator, Kwei-ke, but he has probably obtained the idea from Dinna, expounding the passage "the fallacies of proof really constitute refutation."[1] So the Hindu logicians were guided by the principle of excluded middle.

Thirdly, that a thing is what it is, that A is A, escaped formulation with them, as indeed it did with Aristotle, but when they say that H, the predicate of the Reason, is concerned with S, the subject of the Thesis, just as it is, including neither more nor less, they are speaking of the identity of the S in the minor premise, or the Reason, with the S in the Thesis. In whatever form of language the S may be expressed, the S in the Reason and the S in the Thesis must be the identical S.

So, then, the traditional three laws of thought form the basis of work for all the Hindu logicians, although not receiving explicit formulation. Probably we could piece together passages in which we could recognize the *principle of sufficient reason*, or Aristotle's *dictum de omni et nullo*, but in this we would be doing violence to the thought of the original. It must, then, be admitted that in explicitness of statement the Indian logic was far inferior to the Aristotelian.

[1] D. Ç., 19:20.

Note IV. Import of the Proposition.

Mr. John Venn, in his "Symbolic Logic,"[1] divides statements respecting the nature of the proposition into three classes:

1. *The Predication View.*—The traditional theory interpreted in the forms A, E, I and O is that the subject does or does not possess certain attributes,[2] or, as stated by Mill, "the meaning of the proposition is that the individual thing denoted by the subject has the attributes connoted by the predicate."[3] The predicate determines the subject when combined with it in the form of a proposition.

2. *The Class Inclusion and Exclusion View,* which regards the proposition as assigning the relations of inclusion and exclusion in which two classes may stand.[4] The doctrine of the Quantification of the Predicate, proposed by Hamilton and developed by the symbolic logicians with the exception of Jevons, depends upon this theory.

3. *The Compartment View.*—"The proposition implies the occupation or non-occupation of compartments. What we are here asked to do is to conceive and invent a notation for all the possible combinations which any number of class terms can yield; and then to find some mode of symbolic expression which shall indicate which of these compartments are empty or occupied by implication involved in a stated proposition."[5] This is the view finally adopted by Mr. Venn, and is the view upon which Symbolic Logic in general depends.[6]

Mr. Alfred Sidgwick adds another to the list in his

[1] Chapter I, pp. 1–30; Chapter VI, pp. 26–53. Also "Mind," V, p. 336 *seq.*, July, 1880.

[2] Symbolic Logic, p. 3.

[3] System of Logic, Book I, Chapter V, § 4.

[4] Symbolic Logic, p. 5.

[5] Symbolic Logic, p. 23.

[6] Cf. Jevons' Pure Logic, §§ 101, 112 and 115.

"Fallacies,"[1] namely, the *Relation View.* Every proposition asserts the manner in which two namable things are related to each other, *e. g.*, as resembling or differing and to what extent; as successive or simultaneous in time or conjoined in space, and whether invariably so or otherwise. Mill is the best representative of this theory, if I understand Mr. Sidgwick's Relation View aright. Mill says,[2] "Existence, Co-existence, Sequence, Causation, Resemblance : one or another is asserted (or denied) in every proposition which is not merely verbal," and he thinks this five-fold division is an exhaustive classification of matter of fact, or relation of things in phenomena. But since "attributes are grounded upon some fact or phenomenon, either of outward sense or of inward consciousness," and since "to possess an attribute is another phrase for being the cause of, or forming a part of, the fact or phenomenon," a proposition, in his system, expresses the fact that "a set of attributes connoted by the subject is constantly accompanied by another set of attributes connoted by the predicate;" "mortality constantly accompanies the attributes of man," this being the meaning of the proposition, "Man is mortal." [3]

With respect to these views it appears to me that the Compartment View is too artificial. Who, in saying that X is Y, really means to state that there are no X's that are not Y's? It may be that there is a logical connection between the two forms of expression, but "All X is Y" conveys one meaning, and "There are no X's which are not Y's," quite another. Of course, "$X\overline{Y} = O$" may be the most convenient way of expressing "X is Y" for the purpose of a Symbolic Logic, but it is by no means the direct meaning of "X is Y." Whether or not competent to express the meaning of a judgment, the Compartment View is a variety of the Class View. When it is said that the compartment "X that is not Y" is

[1] Fallacies, p. 53 *seq.*, originally appeared in "Mind," VIII, p. 22 *seq.*, January, 1883.

[2] Logic, Book I, Chapter V, § 6.

[3] Logic, Book I, Chapter V, § 4.

unoccupied ("$X\bar{Y} = O$") it means that there is no such class as the one in which X and $\bar{Y}$ can be found together. Only, in the Class View, a proposition is considered as signifying the relation between the class X and the class Y, while in the Compartment View a proposition is considered as signifying the existence or non-existence of the class $X\bar{Y}$. The former is concerned with the simple classes X and Y, and the latter with the compound classes XY, $X\bar{Y}$, etc. Both theories view the proposition as dealing with the comparison of denotations. For example, "Man is mortal" means that the class of things called man is a portion of the class of things called mortal. Opposed to this view is the Relation Theory, which considers the judgment as a comparison of connotations. "Man is mortal" means that the attributes of man are constantly accompanied by the attributes of mortality. Though both of these views may form possible interpretations of the meaning of the proposition, the most popular way of regarding the proposition the so-called Predication Theory. According to this view, something (the predicate) is said about something (the subject). The subject is determined by the predicate, a proposition connecting the attributes connoted by the predicate to the individual thing or things denoted by the subject. Thus, the Predication View takes the subject in its denotation only and the predicate in its connotation only.

If we were to classify the theories of judgment in terms of denotation and connotation, a fourth attitude towards the judgment suggests itself as possible. In the three theories already discussed, we have seen (1) that both subject and predicate could be taken in their denotation, or (2) both could be taken in their connotation, or (3) the subject could be taken in its denotation and the predicate in its connotation. And the fourth way of looking at the matter would be to take the subject in its connotation and the predicate in its denotation,—just the reverse of the Predication View. That is to say, when it is stated "Man is mortal," the proposition means that the

set of attributes connoted by a man is in some way related to some individuals denoted by "mortal." This view, it will be seen, necessitates the quantification of the predicate in every proposition, just as the Class View does. This may not be an objection, but the quantification of the predicate removes the distinction between a proposition and its converse. "All A is some B" is identical with "Some B is all A." The differentiation, too, of subject and predicate is unnecessary where every proposition is in the form, "A is A." So then, this possible fourth view takes a proposition as signifying that the set of attributes connoted by a term always accompanies the set of attributes denoted by the other term, which is, after all, the Predication Theory. Therefore, with respect to denotation and connotation there remain three distinct theories of the proposition, the Relation Theory, the Class Theory and the Predication Theory.

In which of these theories does the treatment of the proposition in Hindu logic belong? In the study of the subject and the predicate of a proposition it was said[1] that that subject stood for the object of our thought and the predicate for the significance of our thought respecting the subject in a given proposition. It was said, moreover, that the predicate is a *mode* of our thinking the subject, and the subject must have the attributes connoted by the predicate. So far the Hindu theory of the judgment would seem most to resemble the Predication View. For it seems to say that in a proposition a certain thing, whether individual or not, is pointed out by the subject, and the predicate determines our way of conceiving it.

Still the identification of this view with the Predication Theory is not complete. It merely says that the subject must have the attributes connoted by the predicate. That may mean simply that the subject must have these attributes among other attributes in order that the predicate may be asserted of it. The individual man Socrates must first have the attribute

[1] Chapter IV, § 10.

of mortality among such other attributes as "wise," "Athenian," etc., in order that the predicate can be termed a *mode* of conception of Socrates in the proposition "Socrates is mortal." But this is not all. It is further said that the predicate *particularizes* the meaning of the subject, that is, particularizes our way of thinking and puts it under a larger genus. Kweike says[1] that the term used in the subject is for itself and for nothing else, but the term used in the predicate is applicable, not to that subject only, but also to many other things. To say this is to treat it as the name of a larger genus. Such statements will be seen to bring us closer to the Class View. "Socrates is wise, is an Athenian, is mortal," etc., at the same time, but in the proposition, "Socrates is mortal" Socrates is conceived in one special way, (in a certain mode, the Hindu logicians would say,) *sc.* as mortal and thus put among other things which can be thought in the same way as mortal, *i. e.*, put in a larger genus. The things denoted by the subject are classed with other things to which the predicate is applicable. Again, it is said that the subject is excluded by the predicate from the *region* of the heterogeneous, that is, from the things to which to predicate is not applicable. This seems to confirm the interpretation of the Hindu theory of the proposition as a Class Theory. By saying "Socrates is mortal," Socrates is differentiated from non-mortal things and is then confined to the class of mortals. This dichotomy of the universe (of discourse) suggests again the Compartment View of the symbolic logicians.

I should say then that the prevailing view of the judgment entertained by Hindu logicians was most closely allied to the Class Theory of the judgment, but it is not to be identified with the doctrine of the Quantification of the Predicate. There seems to be no such tendency to remove the distinction between the subject and the predicate, as is the outcome of equational logic.

[1] G. C., 1:27; also Cf. Z. G., 2:19–20.

Note V. Theory of Inference.

In a note on "The Laws of Thought," we saw that the Hindu logicians were conscious of, and to a certain extent made use of, certain principles on which every inference ultimately depends. These principles, generally called Laws of Thought, state the significance of an affirmative judgment and its relation to a negative, but they are not immediately applicable to the process of inference. They are assumed, however, to be all that they pretend to be, fundamental principles of consistent thinking, but nothing more. When we come to treat of the relation between three or more terms there is another principle in traditional logic by the guidance of which an inference is effected.

The revolution in logic that has come about during the last decades has been a remarkable one. The science of reasoning, once buried in the scholastic cloisters, has revived with a fresh vigor. The question as to the nature and validity of inference has been made the centre of active debate. We hear of "association of ideas," "substitution of similars," "from particular to particular," "analysis and synthesis," "subsumption and construction,"—these and other phrases intended to express some fundamental principle of inference. In the present note it is not intended to give all these theories of inference, nor is it the aim of this monograph to criticise modern logic. We wish merely to examine the Hindu theory of inference and to give some notion of its resemblance to recognized modern theories.

Mill says in his "Logic,"[1] "Every syllogism comes within the following general formula:

> Attribute A is a mark of attribute B,
> The given object has the mark A,
> therefore,
> The given object has the attribute B."

[1] System of Logic, Book II, Ch. II, § 4.

But our right to make this inference is expressed in the form of the axiom, "Whatever is a mark of any mark is a mark of that of which this last is a mark." And when we remember that Dinna taught[1] that the attributes connoted by the Predicate must inevitably belong to Hetu in a syllogistic inference; and that to show this inevitability we must assert once for all that all things which are denoted by the middle term have the attributes connoted by the major term, it would seem that Dinna's fundamental thought lay very close to that of Mill. On closer examination, however, it would appear that Dinna was not so much concerned with the marks of things as with their inclusion in, or exclusion from, classes.

Although to have certain attributes is a necessary condition to being in a certain class, Dinna's emphasis, when he is stating the place of a proposition in the system of inference, is upon the class, not upon the attribute. To be sure, Dinna said that H should have the attribute P in order that S may be taken to be P. But to have the attribute P means that the thing is in the class P. Again, Dinna wanted to ascertain that the attribute "carbon" is a mark of the attribute "combustibility," but that is equivalent to saying that he wanted to ascertain whether anything in the class "carbon" is in the class "combustible matter." His sole aim was to make certain that there is nothing which may be called "carbon" and not called "combustible," for only upon this condition can we infer that diamonds, which are carbon, are combustible. This view of Dinna's theory of inference may be made clear if we examine his doctrine of Hetu with some care. The second phase of Hetu he states in the form, "H is necessarily in P." That is, as he explains,[2] anything that is H is P, but not necessarily any P. There is no obscurity in this: Dinna identifies the things denoted by H with some of the things denoted by P. Had he meant that the things denoted by H necessarily have

[1] D. Ç., 15. Cf. Chapter IV, § 13.
[2] D. Ç., 12 *b*.

the attributes connoted by P,—which, by the way, is a possible interpretation of the original "*go-hin*," "homogeneous," an adjective without the qualified noun "attribute" or "individual"—then why should he caution us against a misunderstanding by saying, "H is not necessarily all P"? If "attribute" is that for which his letters H and P stand, then H should necessarily have the P attributes. It must have been individuals of the class P that he had in mind. So then, Dinna's major premise is an inclusion of one class of things in another, and not an assertion that one set of attributes is the mark of another. One may, of course, reflect that the possession of certain marks is involved in the inclusion in a certain class. The only question is: which of these two related conditions is the one upon which the syllogism as viewed by Dinna rests?—and for reasons above pointed out, I feel inclined to think that his emphasis lies upon the Class View.

There is no way in which we can ascertain the nature of the relation of the two terms of the minor premise, save as a corollary to the general view of the proposition entertained by Hindu logicians, namely, the inclusion of one class in another. But since this attitude toward the proposition was confirmed by the principle underlying Dinna's introduction of the major term, we may reasonably understand the minor term to be subject to a similar interpretation. So then, an inference in Hindu logic takes the following theoretical form:

S class is in P class,
because
S class is in H class,
H class is in P class;

and the inference is made upon the principle that *whatever is in a class is in another class in which the first class is*, corresponding to Aristotle's *dictum de omni et nullo*.

Professor Jevons criticises Aristotle's *dicta*, and says rightly:[1] "These *dicta* enable us to pass from the predicate to the

[1] The Substitution of Similars, § 10.

subject, and to affirm of the subject whatever we know or can affirm of the predicate, but we are not authorized to pass in the other direction, from the subject to the predicate, because the proposition states the inclusion of the subject in the predicate, and not of the predicate in the subject." The Hindu principle is equally open to this objection; and not only these two, but any system of logic which does not involve the doctrine of the quantification of the predicate, which doctrine, however, reduces the proposition to a mere equation.

To the confusion of Aristotle, Professor Jevons has invented a new system, and with his machine he has shown the old philosopher the wonderful performance of mechanical inference. The axiom upon which his inference is based is that "Whatever is true of a thing is true of its like,"[1] which was modeled after the Euclidian axiom, "Things equal to the same thing are equal to each other." The process of reasoning based upon such an axiom is called "the substitution of similars."[2]

As to this system of Professor Jevons, it works admirably so far as syllogistic reasoning is concerned, and especially is his treatment of the indirect method of inference better than that of Boole and others, although it is thought by some critics not to proceed upon the Principle of Substitution.[3] The equational view of the proposition is probably erroneous; substitution may not be the real essence of inference; Jevons's methods may not all proceed by the substitution of similars, yet it cannot be denied that within certain limits his methods of inference are very efficient. Mr. G. C. Robertson thinks[4] that the traditional logic is not inferior to Jevons's system, and that the "substitution of similars" is only profitable when

[1] The Substitution of Similars, § 14.

[2] The Substitution of Similars, § 19. Principles of Science, Book I, Chapter I, § 9. The substitution theory is said to have been conceived by Beneke, also: Ueberweg's Logik, § 120, Eng. trans., 445 *seq.*

[3] F. H. Bradley: Principles of Logic, Book II, Part II, Chapter IV, § 8.

[4] "Mind," Vol. I, 206 *seq.*, April, 1876.

every proposition is in the equational form. Hindu logic went so far as to lay emphasis on the denotation of terms in a proposition, and to view the proposition as stating class relations, but it made no closer approach to equational logic, and its inference, in point of efficiency, is in no way superior to the Aristotelian.

Certain attributes, however, are the marks of a certain class of things, and one class is distinguished from another only by the marks of attributes. To have the attribute A is to be in the class A. Therefore, to say that the attributes of "man" are the mark of the attribute "mortal," is the same as to say that the class "man" has the mark of the class "mortal," or that the class "man" is in the class "mortal." And the principle that "whatever has any mark has that of which it is the mark" is, after all, only a different expression of the principle "whatever is in a class is in the class which includes the class." So then, although Mill may think[1] that Aristotle's *dicta* are the "axioms of the logic of mere consistency," he must admit that the Hindu axiom is like his own, "the proper axiom for the pursuit of truth by way of deduction." The difference between the doctrine of Mill and that of Dinna is that while Mill holds that the marks or attributes make an inference possible, Dinna maintains that the inclusion of things in a class is that upon which inference is based.

An article appeared in "Mind" a few years ago,[2] with the title, "The Nature of Inference in Hindu Logic," by Mr. S. N. Gupta. It is a very interesting article, especially to the student of Hindu logic in Chinese and Japanese literature, as it is altogether from Indian sources, and it is extremely difficult for outsiders to obtain information about Hindu logic as preserved in its birthplace. In this article, Mr. Gupta says that Hindu logic is *Pramāṇa-vāda, i. e.*, the doctrine of proof, and he also calls it an objective logic. That is exactly what I

[1] Footnote at close of Book II, Chapter II, System of Logic.

[2] "Mind," new series, Vol. IV, 157 *seq.*, April, 1895.

have said in the notes, "Hetuvidyā as Logic" and "Proof and Deduction." But when Mr. Gupta discusses the nature of inference in Hindu logic, which is our subject, he says[1] that it is "from particular to particular," and is what Mill would call "the true type of reasoning." He goes on to ask: What is the use of the major premise? and finally tells us that it is reasoning in "cakraka" (circle). This statement surprises me greatly. Is Dinna's Dvāra-tāraka-çāstra not known in India? Is Çaṃkara's great Introduction lost from the memory of the Hindoos? If they are known, Mr. Gupta would not have ignored their doctrines, however persuasive Mill's argument against the major premise may be. At any rate, Hindu logic as preserved in China and Japan is by no means of the character indicated by Mr. Gupta. According to the Chinese translation of the Nyāya-dvāra-tāraka-çāstra (there are two translations by entirely different hands and one of the translators was in India for sixteen years as a student and understood Sanskrit perfectly), Mahādiññāga, the reformer of Hindu logic, introduced a universal proposition to take the place of the old analogical examples, consisting of particular cases. And what is more, he expressly objects in that book to the inference from particular to particular, devoting to the subject fully two pages. He says,[2] "If Hetu and the homogeneous examples (P's) were separate, the necessary connection between Hetu and the predicate of the thesis (between H and P) would never be known and the result would be only a possibility and of no use. Why of no use? Because an analogical example must be proved to be H and P by still another example, *ad infinitum.*" Hence it is necessary, he thought, to introduce a universal proposition to replace the particular examples. *Inference is from general to particular* in Mahādiññāga's logic as preserved in China and Japan.

[1] "Mind," new series, Vol. IV, p. 163.
[2] D. Ç., 15, b.

NOTE VI. THE SYLLOGISM.

The kind of inference embodied in syllogistic form is a bone of contention among modern logicians. The question as to whether the syllogism represents a process of inference at all is raised by J. S. Mill. His well-known argument may briefly be stated as follows: In a syllogism the conclusion seems to be drawn from the major premise, but in reality the truth of the major premise presupposes the truth of the conclusion, for as long as there is any uncertainty about the conclusion, the major premise is not certain—a syllogism presupposes what it is supposed to prove—there is a *petitio principii.* When we say,

All men are mortal,
Socrates is a man,
therefore
Socrates is mortal,

Mill argues that the mortality of "all men" could not have been known had it not already been ascertained that Socrates, one of the men, was mortal. Where would be the truth of the major premise, "all men are mortal," if the truth of the conclusion, "Socrates is mortal," were not already certain? [1] It is indeed impossible for an empiricist to maintain the logical consistency of the syllogism, and Mill was obliged to maintain that "All inferences are from particular to particular: general propositions are merely inductions from inferences already made, and short formulæ for making more:—the real logical antecedent (premise) being the particular facts from which the general proposition was collected by induction."[2]

Whether all inferences are from particular to particular may well be questioned, but that the syllogism is not a case in exception is Mill's main thesis, and we must admit that he has presented it with great clearness and force. Professor Chris-

[1] System of Logic, Book II, Chapter III, §§ 1 and 2.
[2] System of Logic, Book II, Chapter III, § 4.

toph Sigwart replies to Mill in this wise:[1] "The universal major premise should not be understood as the statement of the *universal* generality, it is the statement of the *necessity* of connecting the predicate with the subject. Mill's position is justifiable to the extent that the universal major premise is drawn from particular data, but it is false that the major premise might be dispensed with in inference. The conclusion does, after all, depend upon the major premise, and cannot be proved without it." Now this necessity Kantian tradition derives from the nature of human thought, to which the enumeration of empirical instances is indifferent. But even if we assume that the major premise expresses necessity derived from this source and that therefore the major premise does not presuppose the examination of the particular case presented in the conclusion, our difficulty arises anew with the minor premise. Suppose we had obtained in this *a priori* way the universal judgment "all men are mortal," then before the judgment is made "man" would not necessarily be conceived as mortal, but by this judgment a new idea "mortal" is added to the concept "man," and it becomes one of the general characteristics of men. Thus it does not presuppose that Socrates or any other man is mortal. So far so good, but when we say "Socrates is a man," the word "man" may be understood in two ways: (1) in the old sense which does not include the notion of mortality, or (2) in the new sense including all that results from the synthetic judgment forming the major premise.

Hermann Lotze[2] points out this ambiguity lurking in the middle term. If "Socrates is a man" means that he is a man in the sense necessarily involving mortality, it is not until we recognize that Socrates is mortal that we can say "Socrates is a man." If "Socrates is mortal" be undecided, we have no right to bring Socrates under the new conception, "man."

[1] Logik, § 55, 3: English trans., Vol. I, 361.

[2] Logik, §§ 98, 99.

Therefore, the conclusion is still presupposed in the minor premise.

The case would be different, I think, had we taken "man" in the first sense. The syllogism would then be:

> Man, with a certain set of attributes,
> has another attribute, mortality,
> Socrates is a man,
> with that certain set of attributes,
> therefore,
> Socrates has another attribute, mortality.

We judge *a priori* that man with a certain set of attributes is necessarily mortal. We cannot know, indeed, whether Socrates is mortal or not, but he is a man, in so far as he has that set of attributes. Thus interpreted, I see no presupposition of the conclusion in the premises of a syllogism. I have expressed all these propositions in terms of the Predication Theory of the judgment, but that does not invalidate the argument,—they can be expressed in the language of the class view or in accordance with any other theory of the proposition.

Thus assuming the possibility of *a priori* judgments, we may be able to escape the old attack, but the trouble with the syllogism from this point of view is of a different nature. For now a syllogism amounts to this only,—

> In our understanding A is necessarily B,
> We conceive of C as an A,
> therefore,
> In our understanding C is necessarily B.

That is, we take a conception as it appears in our human understanding, analyze it, and then say a certain thing comes under this concept. In our understanding A and B are inseparable: if C is an A, B goes with it, of course,—that is all there is in the syllogism. So then, "C is an A, therefore C is a B," is a mere repetition of what was said in "A is B." The major premise states the natural attitude of the human

mind; the minor premise brings in a particular case; and the conclusion tells us that the mind would think case in the only way in which the mind can think it,—that stated in the general terms of the major premise. In the beginning the syllogism says that the mind must in general think in one certain way, and then says that the mind will not think in any particular case in any other manner than its necessary way. The general disposition of the mind is repeated in the conclusion, which was set forth in the major premise,—if I see the whole sheet of paper white, I, of course, see the corner of it white. Therefore the *a priori* judgment of the major premise leaves the conclusion a mere repetition of the major premise. Viewed in this light the syllogism could be stated,—

> One always judges A to be B,
> One judges A in any case C,
> therefore, to be B,

that is

> All A is B,
> therefore,
> Some A is B,

and it has even been questioned whether such a transformation of judgment is worth calling an inference at all. The result, then, of the preceding consideration is this,—if all our knowledge comes *a posteriori*, every syllogism involves a *petitio principii;* if some of our knowledge arises *a priori*, a syllogism still presupposes the truth of its conclusion, the one or the other of its premises; or else, taken at its best, it escapes a *petitio principii* to sink into tautology—it repeats in the conclusion what was said in the major premise.

Alexander Bain, in a reply to Mill, maintains[1] that Mill's attack is upon inference, not upon the syllogism. That is, Bain looks upon the syllogism as a mere form of inference from given premises to a possible conclusion; and as a form there is nothing objectionable in it. Given "A is B, B is C," the

[1] "Mind," Vol. III, 137, January, 1878.

rules of the syllogistic form tell us that the possible conclusion by the combination of these three concepts is "A is C." It is not because we know "A is C," that we assert at first "A is B," or "B is C," but both premises were given and the problem was: what is to result from combining them in our thought? Syllogistic rules tell us that the conclusion must be "A is C." Indeed, there is no *petitio principii* in a syllogism regarded in this light, but then a syllogism is no longer considered as an argument to prove the truth of the conclusion, and, of course, Mill never attacked the syllogism that Bain defends. It seems to me, however, that the syllogism tells only the logical conclusion of what is signified by the given premises. It cannot claim for itself a form of inference,—that is, it presents no transition from the known to the unknown. It cannot, then, give us any information other than that of which we were in possession when the premises were stated. It says only that "A is C" is involved in "A is B and B is C." The conclusion of a syllogism is a repetition of the combined significance of the two premises. Therefore, our conclusion is still that the syllogism either involves a *petitio principii*, or merely repeats in its conclusion what was already given, that is, becomes tautologous.

Now in Hindu logic an inference is made by the simple subordination of one class to another. Of course, the emphasis on class concepts does not save the syllogism from the criticisms that have just been urged. But in one respect the attitude of Hindu logic is more justifiable. It does not pretend to be a logic of discovery, but to be a logic of proof,—proof which establishes the truth of an assertion by means of those already accepted; a reasoning which shows that an assertion is the necessary consequence of some others; a reasoning, indeed, which says that if you have accepted one or more assertions, you must accept this one which is involved in those you have already entertained. What is meant in calling itself a science of reasoning is this: that it shows the

way in which by the use of reason our knowledge may be systematized.

But after all, the accusation of *petitio principii* can be made with as much force against the syllogism of proof as against the syllogism of inference. In the reasoning, "A is C because A is B and B is C," either "B is C," or "A is B" can be admitted only if it is certain that A is C, and therefore the reasoning is circular. It may be said that the syllogism as such is not concerned with the question whether "B is C" or "A is C" be true, it merely states that if the statement "A is B and B is C" be accepted as true, then "A is C" is true also. It is the business of proof, then, "merely to expound and unfold the assertion wrapped up, as it were, and implied in those with which we set out, and to bring a person (an opponent) to perceive and acknowledge the full force of that which he has admitted."[1] But this is just what the assailants of the syllogism have been saying—it is "a contrivance for catching you in a trap and holding you fast in it."[2] Especially does this seem true if we remember that Hindu logic is a material logic which seeks all the data of reasoning in the world of experience. It can scarcely be said, then, that it does not concern such a logic whether "A is B and B is C" be true or not. The syllogism in Hindu logic, at least in Dinna's logic, cannot escape from the fatal accusation of *petitio principii.*

What, then, is the value of the Hindu syllogism of proof? None whatever? We are afraid that we can claim for it little more than none. It confesses itself to be repeating in the thesis what is involved in the reasons which are selected to prove the truth of the thesis; and what it repeats is, in fact, a mere arbitrary assumption.

Indeed, so long as it pretends to prove the truth of anything by the syllogism in that form, we fail to see any value

[1] Whately's Logic, new and revised ed., Book IV, Chapter II, § 1.

[2] Mill, System of Logic, Book II, Chapter III, § 2.

in the logic. Even if it did not pretend to prove any unknown thing, an inferenee from general to particular still shares all the characteristics of an inference of proof. As we have seen, even granting the possibility of an *a priori* judgment and thus escaping the original form of the accusation of *petitio principii*, a syllogism still merely repeats in the conclusion what it said in the premises and gives us no new information. It will be seen that we have not discussed the question of the value or validity of inference in general, but only of that particular form of inference presented in the syllogism. Other types there may be, both valid and valuable, but since Hindu reasoning is distinctively syllogistic reasoning,—the doctrine of *Hetu* or middle term,—our purpose does not permit us to discuss this more general question.

Note VII. The Connection Between Hindu and Greek Logic.

In order not to interrupt the continuity of the text, I have omitted a question of purely historical interest, that of the connection between Hindu and Greek logic. It may, however, repay us briefly to consider the possibility of such connection. In treating of the history of Hindu logic, we came to the conclusion that the logic from which Aristotle might have borrowed some of his thought is of altogether too late a date to have served as a source for Aristotle. The only channel of communication between Indian and Greek thought would have been the expedition of Alexander, and there is no evidence that Alexander brought back any logical books from India, nor that Aristotle had the opportunity of examining such books,—it is a mere possibility. Moreover, the treatment of logic by Mahādiǹnāga and Çaṃkara is so different from Aristotle's way of handling the subject that one who compares the two would deny *prima facie* the connection between them. We regret, indeed, that we have not the forty volumes of Dinna's logical works mentioned by Kweike. But if Dinna treated, *e.g.*, the opposition and conversion of propositions and the like concerning the forms of inference in the way Aristotle did in his *Analytica*, or was interested in things at all resembling those treated of in the *De Interpretatione*, or in the *Topica*, we can reasonably expect his able disciple Çaṃkara to speak of them, at least, and make some reference to them in his Introduction to Dinna's Logic. But since Çaṃkara gives us no hint of any doctrines not contained in some of Dinna's extant works, we may conclude that we have about all of Dinna's doctrine. And what we have is far inferior to Aristotle's. Indeed, Aristotle could not have made any use of it, even if he had had it, except, perhaps, the doctrine

of the Three Phases of Hetu. It seems that this "argument from silence" is very strong against the probability of a better logic attributed to Dinna than that now in our possession. Therefore, I for one cannot believe that Aristotle borrowed his logic from the Hindoos. And let me repeat it again,—chronologically all that Aristotle could have got from India was the Hindu logic in its primitive stage, not the advanced logic as presented by Dinna. But Aristotle could have obtained far better suggestions from Plato or from the Sophists.

On the other hand, it is clearly improbable that Dinna was influenced in his development by Aristotle. There is, of course, no chronological impossibility in this case. But Dinna's manner of treatment is so different as not in the least to suggest Aristotelian models. An intelligence adequate to produce the work which Dinna actually accomplished would have been perfectly able to appreciate the superiority of Aristotle's system, had it been acquainted with it, and would not have hesitated to make use of it, yet the final product of Dinna is considerably inferior to the work of Aristotle. And then we should naturally expect to find parallels in the two systems. For example, there was in India a doctrine of the categories developed in the Vaiçeshika philosophy,[1] which in no way conflicts with the Nyāya doctrines (some say that the Nyāya philosophy is the development of the Vaiçeshika philosophy),[2] and if Dinna had ever read any of Aristotle's works he would naturally have used the Vaiçeshika categories and embodied them in the Nyāya logic after the Aristotelian fashion, but not a word is spoken in his Çāstra or in Çaṃkara's. Ueberweg thought[3] that perhaps the Nyāya logic first arose under Greek influence, and quotes an example from Colebrook's Essays, which is the five-propositioned syllogism

[1] Cf. Kaṇāda's system, in § 1; also see Kaṇāda's Vaiçeshika Aphorisms, Bk. I, Aph. 4 *et seq.*

[2] Prof. Richard Garbe: Die Sāṃkhya-Philosophie, 119.

[3] Logik, § 10, Eng. trans., 20.

of the old system, but he fails to give any reason whatever for his hypothesis.

So far as we know, then, the connection between the Hindu logic and the Greek logic has not yet been established, and so far as the Hindu logic as preserved in China and Japan is concerned, I find no sign of its having had a Greek origin.

APPENDIX.

A Bibliography of the Hindu Logic in China and Japan.

The names in the following bibliography are given the Kwan pronunciation. The works are arranged under the authors.

Those which bear in their names "*Chuh-kai*," "*Gi*," "*Giki*," "*Ki*," "*Sau*," "*Shi-ki*," or "*So*," are commentaries or notes of some sort upon some famous works, such as those of Dinna, Çaṃkara, Kinei Ke, etc., and those with asterisks are the most important works.

[It is clear that the system of transliteration employed in this bibliography (as, indeed, throughout the work) is not consistent. We are informed by experts that it would be impossible to correct this fault save by comparison with the original characters, and that even the most careful transliteration has proved unsatisfactory. It would appear, however, that the names as printed afford a clue sufficient to enable a Chinese or Japanese scholar to identify the originals in a catalogue. We publish the bibliography with the hope that to this extent it may prove useful.—Ed.]

Ba-doh (Shuh-choh Ki-koh), of Koh-fuku-ji (China):
- Shi-soh-i-shi-ki, (Tai-so).

Bum-bi, of Koh-fuku-ji (China):
- So (Sei-ri-ron), 3 vols.
- Sau (Sei-ri-ron).
- Chuh-kai (Sei-ri-ron), 1 vol.
- Ron-sau (Nyuh-sei-ri), 1 vol.
- Ron-so, (Nyuh-sei-ri).

Bun-ki, of Shoh-gen-ji (China):
- So (Sei-ri-ron), 3 vols.
- So (Nyuh-sei-ri), 3 vols.
- So (Nyuh-sei-ri), 3 vols., with a preface and a postscript.

Çaṃkara.—See Ten-shu.

Chi-ei:
- San-yoh-ki, 1 vol.

Chi-hin, Ju-shuh:
- Ki (Tai-so), 3 vols.[1]

Chi-kwaku, Soh Yei-mai, Jen-shi:
- Soh-kyoh-Shuh.

Chi-shoh (En-chin), of Mi-i-dera (Japan):
- Shi-soh-i-(shi)-ki.

Chi-shuh, of Hoh-joh-ji, Boku-yoh (China):
- So Jen-ki, 3 vols. (known as the Prior Note).
- So Kon-ki, 3 vols. (known as the Posterior Note).
- Ryak-ki (So), 1 vol.—authenticity doubted.
- Gi-dan-ki, 1 vol.
- San-yoh-ki (or -sau), 1 vol.

Chin-kai (Ki-koh):
Shi-soh-i-shi-ki, 3 vols.
Cho-ken, of Hoh-ryu-ji, Yamato (Japan):
So Ki (Notes on T. S.)
Cho-roh, of Yaku-shi-ji, Kio-to (Japan):
So Ki (Notes on T. S.)
Shi-soh-i-shi-ki (Cho-roh's Ri-sho-shuh).
Cho-sai, of Toh-dai-ji:
San-ryoh-sai (So Ki).
Chuh-san:
So Gwk-ki, 5 vols.
Kyu-ku-gi-shi-ki (Private Notes on the Nine Categories).
Chuh-seu, of Toh-dai-ji:
Kyu-ku-gi-ki (Notes on the Nine Categories.)
Da-yu-ga:
Bi-kes-tu-shu-kyoh, 3 vols.
Dai-soh-in-shu:
So-ki.
Dai-wa:
So-ki.
* Dinna (Mahādiññāga):
Sei-ri-mon-ron, I vol., translations by Hiuent-sang, and also by Gishoh. (Generally called Sei-ri-ron.)
Doh-en, of Dai-an-ji:
So-ki.
Doh-ken:
San-yoh-ki, I vol.
Doh-ken (disciple of Shoh), of China:
Doh-ron-sau, (of Sei-ri-ron), I vol.
Ron-gi-shin, (Nyu-sei-ri), I vol.
Ron-soh-ki, (of Nyu-sei-ri), 3 vols.
Doh-sen, Fuh-ki San, Wa-shu:
Shi-soh-i-gi, I vol.
Kan-shin, 3 vols.
Dai-gi-sau.
Doh-shoh:
Ron-sau, 2 vols.
Ron-so (Sei-ri-ron), 2 vols.
Ron-so (Nyu-sei-ri), 2 vols.
Doh-yu, of Kwai-gen-ji (China):
So-ki (Tai-so), 3 vols.
Gi-ki (Tai-so), I vol.
Gi-han, 3 vols.
Eh-Cho, of Sai-on-ji, Wa-sei:
So-ki.

En-byo, of Toh-dai-ji:
    So-ki.
En-gi, of Toh-dai-ji:
    So-ki (Shi-soh-i-shi-ki), 3 vols.
En-go (Shi-go):
    Ron-siu-sau, (Nyu-sei-ri) 1 vol.
En-ju:
    Ji-ku-ryo-shu, 2 vols.
En-mei, of Toh-dai-ji:
    So-ki.
En-shoku, of Seh-mei-ji (China):
    Ron-so, (Sei-ri-ron), 2 vols.
Fu-koh, of Ji-on-ji (China):
    Tai-men-san-zoh-ki (authenticity doubted).
Fuku-zen:
    Ko-kon-sau-ho-sei-koh (Nyu-sei-ri), 2 vols.
Futsu-riu:
    Gi-dan-ki, 1 vol.
Gan-ken, of Koh-fuku-ji, Nara (Japan):
    Shuh-ki (Taiso), 6 vols.
    Roku-in-gi-shuh-ki (Taiso), 1 vol.
    Immyo-gi-kotsu, 3 vols. (Some edition without the 2nd vol.)
    Gi-dan Shuh-ki, 1 vol.
    San-yoh Shuh-ki, 1 vol.
    I-ron-hi-ryoh-shuh-ki, 1 vol.
    Shoh-gun-hi-ryoh-shuh-ki, 1 vol.
Gan-gyoh (Enshuh Risshi), of Gen-koh-ji:
    Ri-mon-ron-gi-kossu.
Gen-eh (Sei-dai-ji), of Nara (Japan):
    Tai-gi-sau (Tai-so).
Gen-gyo (Corea):
    Nyu-sei-ri-ron-ki (so), 1 vol.
    Ham-pi-ryoh-ron, 1 vol.
Gen-oh:
    Ron-so (Nyu-sei-ri), 3 vols
Gen-han, of China:
    Ron-so (Sei-ri-ron), 1 vol.
    Ron-so (Nyuh-sei-ri), 1 vol.
Gen-shin, Yoko-kawa (Ei-san), Japan:
    Shi-soh-i-chuh-shyaku.
    Gidan-chuh.
    Sanyoh-chuh.
Gi-shin:
    En-mitsu-shu-ki, 3 vols.

Gi-yuh:
Sei-seh-sau (Hak-kan-kwa-bun), 3 vols. (or 2 vols.)
Go-mei, of Gen-koh-ji, Nara (Japan):
Juh-shi-kwa-rui-ki, 1 vol. (Notes on "Fourteen Fallacies.")
Kai-set-su-ki, 6 vols.
Ken-shin-shoh.
Ha-joh-shoh.
Bun-ryo-kestu.
Go-shin:
Bi-kestu-ryaku-sau, 2 vols.
Gyo-ga:
Isiki-hiryoh-ken-gi-kyoh-shin-shoh, 1 vol.
Heh-bi, Mei-koh:
So-ki, 9 vols.
Sen-kin-baku-den.
Shi-soh-i-tan-seki (so).
Heh-chi, of Yaku-shi-ji, Kioto (Japan):
Kyuh-ku-gi-ki.
Heh-gen, of Hiro-oka-dera, Kawachi (Japan):
Ki.
Heh-nin, of Koh-fuku-ji:
Kyuh-kugi-shiki, 3 vols.
Ki.
Hiuen-tsang (San-zoh Daijoh-gen-tai-men):
Sei-ri-ron-so (Rimon So), Eh-bi 3, 6:
Hieki (koh):
Nyuh-sei-ri-so, 3 vols.
Hoh-sei, of Jen-chi-ji (Tendai, renge, shuhsun, iyoh):
So-ki.
Hon-shin:
Tsui-nan-ryak-Shyaku (Nyu-sei-ri), 1 vol.
Jan-an, of Toh-dai-ji, Nara (Japan):
Nyuh-sei-ri Soki.
Jen-shu, Shaku-joh-san, Wa-shuh:
Gi-sau (Sei-ri-ron), 2 vols.
Meh-Toh Sau (Tai-so) 12 vols. (sometimes in 6 vols.)
Jen-shuh, of Chuh-kyo-ji:
So-ki.
Jin-kaku, of Dai-an-ji, Wa-nan:
Shi-soh-i-shi-ki (So-ki).
Jo-ri (disciple of Shoh), of Fuku-shuh-ji (China):
San-yoh-ki, 1 vol.
Joh-gan:
Ron-so (Sei-ri-ron), 3 vols.
Ron-betsu-gi-sau (Nyuh-sei-ri), 1 vol.

Joh-soh:
    Gi-yuh-sau (Nyuh-sei-ri), 7 vols.
Juh-hoh, Soh-ji-ji:
    So-ki.
Juh-in:
    Ryaku-sau (Nyu-sei-ri), 2 vols.
Jun-kei (Corea):
    Ron-sau, 1 vol. (Nyuh-sei-ri-ron-so?).
Keh-chi:
    Gi-gi-dai-sau, 2 vols.
    Gi-gi-sau, 6 vols. (Kwa-bun, 1 vol.)
Keh-den:
    Gi-suh-sau, 12 vols. (7 vols.)
    Ho-ketsu-sau (Nyuh-sei-ri), 1 vol.
Keh-koh:
    Ron-gi-sau (Sei-ri-ron), 1 vol.
Keh-rin, Shuh-fuku-ji, Heh-shuh, Soh.
    En-mistu-sau (Nyu-sei-ri), 7 vols.
Keh-shin, of Toh-dai-ji:
    Ki.
Keh-sinn:
    Shu-kyoh (Nyu-sei-ri), 2 vols.
    En-mitsu-shu-ki, 3 vols.
Keh-sen, (Joh-kei-ji):
    Ron-se (Nyu-sei-ri).
    Ki (Nyu-sei-ri).
Keh-shoh, of Daiun-ji:
    Rysku-san (Nyuh-sei-ri), 4 vols. (authenticity doubted).
    * Gi-dan, 1 vol. (some editions in 3 vols. ?)
    * San-yoh.
    Gi-san-yoh, 3 vols.
    Ji-ryoh-shoh, 1 vol.
Keh-shu:
    San-yoh-ki, 1 vol.
Keh-so:
    Yoh-ryak-ki.
Ken (Hoh-shi):
    Gi-dan-sau, 1 vol.
Ken:
    San-yoh-sau, 1 vol.
Ken-oh, Gen-koh-ji (Mei-sen's disciple):
    Ryuh-ki.
Kira, of Mekawa:
    Koh-gi (Nyu-sei-ri), 2 vols.
Ki-sen:
    Kwa-rui-so, 1 vol.

Ki-soh, of Sui-fuku-ji:
    Ron-jistu-ki (Sei-ri-ron), 2 vols.
    Nyuh-sei-ri-so.
Kita-batake, Dohryuh:
    Yo-ben (Nyu-sei-ri), 3 vols.
Koh-ei:
    Shi-soh-i-shi-ki (So).
Koh-jin:
    So-ki, 3 vols.
Kuh-sei, of Koh-fuku-ji (North Hall), Nara (Japan):
    Shi-soh-i-shi-ki (Shi-ki of the Hall), 3 vols.
    So-ki.
Kuh-soh:
    So-ki.
Kwai-doh, Rin-joh-shi:
    San-kai-ko-koh (San-juh-sau-kwa), 3 vols.
Kwai-gwa:
    Shuh-gen-shu-sau (Nyuh-sei-ri-ron), 3 vols.
Kwaku-ken, Tsubo-saka:
    Kyoh-ju-sau, 3 vols.
    So-ki.
Kwaku-sei, Toh-in:
    So-ki.
Kwan-ri, of Toh-dai-ji (Southeast Hall), Nara (Japan):
    Shi-son-i-shi-ki (The Shi-ki of the Hall).
    So-ki.
Kwei-ke, Jionji:
    * Immyo-Nyuh-sei-ri-ron-so, 6 vols (known as Tai-so).
    Rimon-ron Kwarui-so.
Kyoh-koh, Kojima:
    San-yoh-ki.
    Gi-dan-ki.
    Shi-soh-i-ki.
Kyoh-kuh:
    Kyoku-han-sho-gaku, 1 vol.
Kyoh-Kyuh (East Hall):
    So-ki.
Mei-sen:
    Shi-soh-i-shi-ki (So), 2 vols.
    San-ju-san-kwa-sa-hoh.
    Doh (So).
    Ri-sho (So), 6 vols.
    San-yoh Doh.
Mo-rin, Hoku-sen:
    So-ki.

Moku-san:
Immyo-san-sei-koh, 30 vols.
Mu-sei:
Doh-hitsu-ken-sau-shich-kwan-kwa, 3 vols. (Some editions in 2).
Mur-kami, Senseh:
Immyo-zensho, 1 vol.
Nan-in Hoh-shi:
Ron-so.
Rai-shin, Ichi-joh-in, Nara:
So-ki.
Rei-an-ji, Ki-koh:
So-ki.
Rei-kwaku, of Toh-koh-ji (China):
Nyuh-sei-ri-so.
Ri-mei:
Ron-gi-so (Nyu-sei-ri), 3 vols.
Ri-shoh, of An-koku-ji, China:
Ron-ki (Nyu-sei-ri), 1 vol.
Ron-gaku-ki (Nyu-sei-ri), 1 vol.
Ron-yoh-shoh (Nyu-sei-ri), 1 vol.
So.
Rin:
Sau (So), 2 vols.
Rinn:
San-yoh-ki, 1 vol.
Ro-sai, Shoh-gyo-yaku-hoh:
Chuh-kai-gi-zu, 3 vols.
Ryo-gen, Eisan:
Ki.
Ryo-hen, Shoh-gan-in:
Tai-so-sau, 10 vols.
Ryoh-yuh, Butso-do-boh, Gen-koh-ji:
So-ki.
Ryuh-koh, of Toh-dai-ji:
Ki.
Ryuh-koh, of Yaku-shi--ji; and Shin-keh, of San-shoh-ji:
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